Town of Shelburne

2024 Asset Management Plan

Adopted June 24, 2024

A People Place, A Change of Pace
SHELBURNE
ONTARIO, CANADA

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Section 1 – Executive Summary

1.1 Introduction

Asset management is a strategic business approach to the administration of capital assets. The goal of asset management is to minimize the cost to maintain assets throughout their lifecycle, understand the risks associated with the management strategy, and maximize the value customers receive from assets and the services they provide.

The goal of the 2024 Asset Management Plan (AMP) is to provide Council, staff, and the public with an understanding of the state of municipal infrastructure and the Town's approach to manage the asset portfolio over a 10-year period.

1.2 Alignment

The 2024 AMP was developed through a careful review of capital asset requirements with leadership from each service area, supported by Treasury/Finance staff and the Asset Management Working Group at each step. This was to ensure optimal alignment with existing documents such as:

- 2024 Annual Budget
- 5-Year Capital Plan 2022-2026
- 2020 Development Charges Study
- 2023 Parks and Recreation Master Plan
- 2023 Water and Wastewater Rate Study and Financial Plan

Additionally, the 2024 AMP was written to be supportive of the 2022-2026 Council Priorities. Specifically, the 2024 AMP is a driver of the "Sustainable" priorities:

- SP1: Responsible financial management through long term planning.
- SP2: Invest in critical infrastructure and services for the future.
- SP3: Promote balanced growth.

1.3 Legislative Compliance

Filed under the Infrastructure for Jobs and Prosperity Act of 2015, Ontario Regulation 588/17 (O. Reg. 588/17) titled Asset Management Planning for Municipal Infrastructure sets forth expectations and deadlines for municipalities to report on asset management progress. On the following page, Figure 1-1 outlines the timelines for O. Reg. 588/17, including the date each document was adopted by Council.

Figure 1-1: Ontario Regulation 588/17 Timelines

Reporting Document	Due Date	Adopted
Strategic Asset Management Policy	Jul 1, 2019	May 27, 2019
Asset Management Plan (Phase 1)	Jul 1, 2022	Jun 13, 2022
Asset Management Plan (Phase 2)	Jul 1, 2024	Jun 24, 2024
Asset Management Plan (Phase 3)	Jul 1, 2025	-

Each phase of the asset management plan has different requirements as to the material that must be discussed:

- Phase 1: Core infrastructure assets
- Phase 2: All infrastructure assets
- Phase 3: Requirements of phase 2 plus proposed of levels of service

If these asset management deadlines are not met, the Town is at risk of becoming ineligible to apply for provincial and federal funding opportunities.

1.4 Asset Portfolio Overview

In compliance with O. Reg 588/17 phase 2 asset management plan requirements, the 2024 AMP reviews the below asset categories:

1. Bridges
2. Culverts
3. Facilities
4. Fleet
5. Land Improvements
6. Machinery and Equipment
7. Roads
8. Sidewalks
9. Signs
10. Stormwater
11. Streetlights
12. Traffic Lights
13. Wastewater
14. Water

It is important to note that while owned by the Town, including the land which they are located on, the following facilities are not reviewed in the 2024 Asset Management Plan:

- Centre Dufferin Recreation Complex
- Shelburne and District Fire Department
- Shelburne Public Library
- Shelburne Curling Club

These facilities are governed by separate boards of management and the Town of Shelburne has no direct care and control over these properties and their related assets.

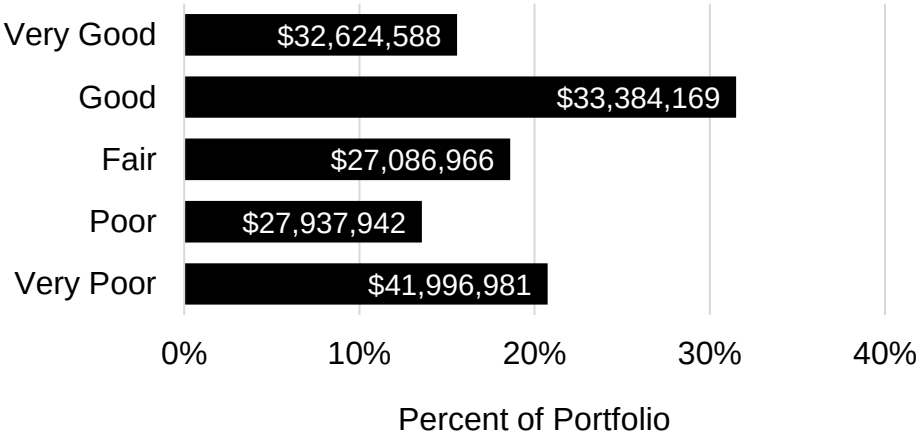
The 2024 replacement cost for the portfolio is displayed in Figure 1-2 below. The percent of the total value of the portfolio has been included for each asset category.

Figure 1-2: Replacement Cost

Category	Replacement Cost	Percent
Bridges	$620,308	0.4%
Culverts	$2,853,929	1.8%
Facilities	$11,496,782	7.1%
Fleet	$2,073,609	1.3%
Land Improvements	$7,753,463	4.8%
Machinery and Equipment	$3,512,744	2.2%
Roads	$25,208,409	15.5%
Sidewalks	$6,397,340	3.9%
Signs	$74,792	<0.1%
Stormwater	$19,384,953	11.9%
Streetlights	$788,008	0.5%
Traffic Lights	$636,280	0.4%
Wastewater	$44,629,373	27.4%
Water	$37,600,656	23.1%
Total	**$163,030,646**	**-**

An overview of the portfolio's condition is presented below in Figure 1-3 along with the replacement cost as of 2024 for assets within each condition rating.

Figure 1-3: Age-Based Condition (2024)



While the Town regularly conducts visual condition assessments for infrastructure, some categories do not yet have visual condition inspection data integrated into the asset inventory. As a result, age-based condition ratings are utilized in Figure 1-3.

Throughout the 2024 AMP, most categories are presented as one section each. The exceptions to this are Section 1: Bridges and Culverts, and Section 11: Transportation, where a group approach is utilized due to the close relation between assets. The assets in each grouped section are:

Bridges and Culverts
- Bridges
- Culverts

Transportation
- Roads
- Sidewalks
- Signs
- Streetlights
- Traffic Lights

1.5 Asset Management Strategy

Strategic management of the portfolio is explored throughout the 2024 AMP by reviewing the lifecycle of assets as three phases, referred to as activities. The activities, reviewed further in section 4.4, are:

1. **Acquisition** – new assets in response to an increase in demand or for growth
2. **Operation and Maintenance** – ongoing costs for assets in-service
3. **Replacement** – replacement of existing assets at the end of their service life

Each lifecycle activity requires regular investment to maintain performance and the desired level of service for each category. On the following page, Figure 1-4 provides a detailed summary of the projected expenditures and estimated level of funding across all lifecycle activities for the portfolio.

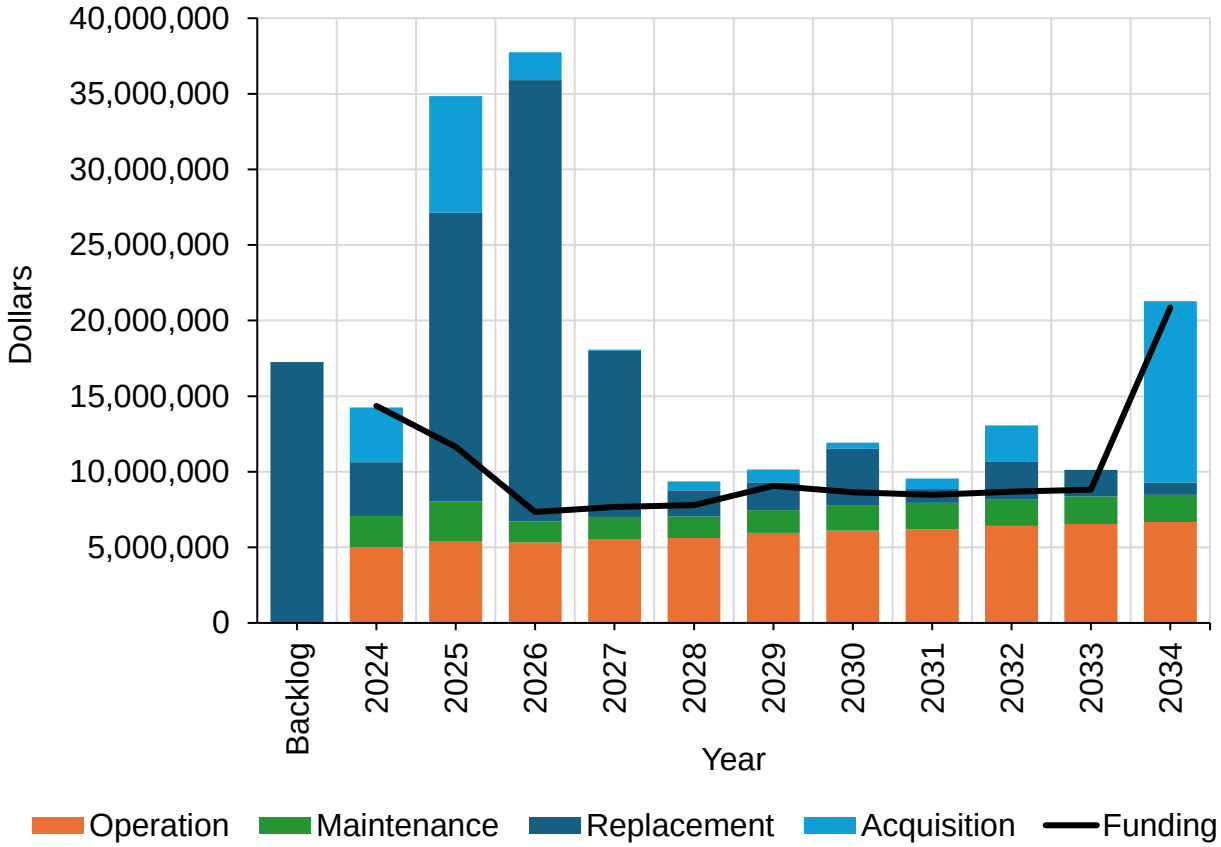
Figure 1-4: Projected Lifecycle Expenditures

Planning Period	Year	Acquisition	Operation	Maintenance	Replacement	Total Projected Expenditures	Total Funding	Balance
Backlog	Backlog	$0			$17,265,042	$17,265,042		-$17,265,042
Year 0	2024	$3,625,597	$5,008,469	$2,071,168	$3,556,973	$14,262,207	$14,354,372	$92,164
Year 1	2025	$7,699,703	$5,380,497	$2,660,199	$19,099,687	$34,840,086	$11,643,036	-$23,197,049
Year 2	2026	$1,858,134	$5,309,951	$1,398,626	$29,187,258	$37,753,969	$7,339,214	-$30,414,756
Year 3	2027	$85,000	$5,516,150	$1,500,992	$10,975,894	$18,078,036	$7,660,458	-$10,417,579
Year 4	2028	$600,000	$5,624,473	$1,408,612	$1,729,986	$9,363,072	$7,799,333	-$1,563,739
Year 5	2029	$847,644	$5,952,181	$1,506,784	$1,837,866	$10,144,476	$9,066,789	-$1,077,687
Year 6	2030	$400,000	$6,096,725	$1,665,520	$3,756,634	$11,918,879	$8,648,941	-$3,269,938
Year 7	2031	$700,000	$6,188,609	$1,764,831	$891,176	$9,544,615	$8,464,414	-$1,080,202
Year 8	2032	$2,407,591	$6,425,638	$1,724,727	$2,506,382	$13,064,338	$8,688,417	-$4,375,921
Year 9	2033	$0	$6,552,151	$1,825,222	$1,741,143	$10,118,515	$8,805,694	-$1,312,821
Year 10	2034	$12,000,000	$6,681,194	$1,786,326	$814,816	$21,282,336	$20,865,256	-$417,080
Total		**$30,223,669**	**$64,736,038**	**$19,313,007**	**$93,362,857**	**$207,635,572**	**$113,335,923**	**-$94,299,648**

The values presented in Figure 1-4 above are consolidated from the projected lifecycle expenditures tables found in the Lifecyle Strategy for each asset category.

On the following page, an overview of these values is found in Figure 1-5.

Figure 1-5: Lifecycle Overview



1.6 Key Challenges and Risk

1.6.1 Funding the Gap

Examining the projected expenditures in Figure 1-4, a total funding shortfall of $94.2M is indicated over the 10-year period. The gap is largely due to the below three partially or completely unfunded items which amount to 70% of the total deficit:

- Water Pollution Control Plant Upgrade and Expansion occurring from 2024 to 2027 for a total of $48,750,000. As of 2024, $2,000,000 is funded.
- Various projects driven by the Parks and Recreation Master Plan occurring 2025 to 2026 for a total of $5,411,152.
- Reconstruction of Centennial Road, Industrial Road, Pine Grove Avenue, and Steeles Street estimated to occur from 2025 to 2032 for a projected $13,456,641.

Following Council's adoption of the 2024 AMP, in preparation of the 2025 Annual Budget and 10-Year Capital Plan, municipal staff will assess strategies to manage the

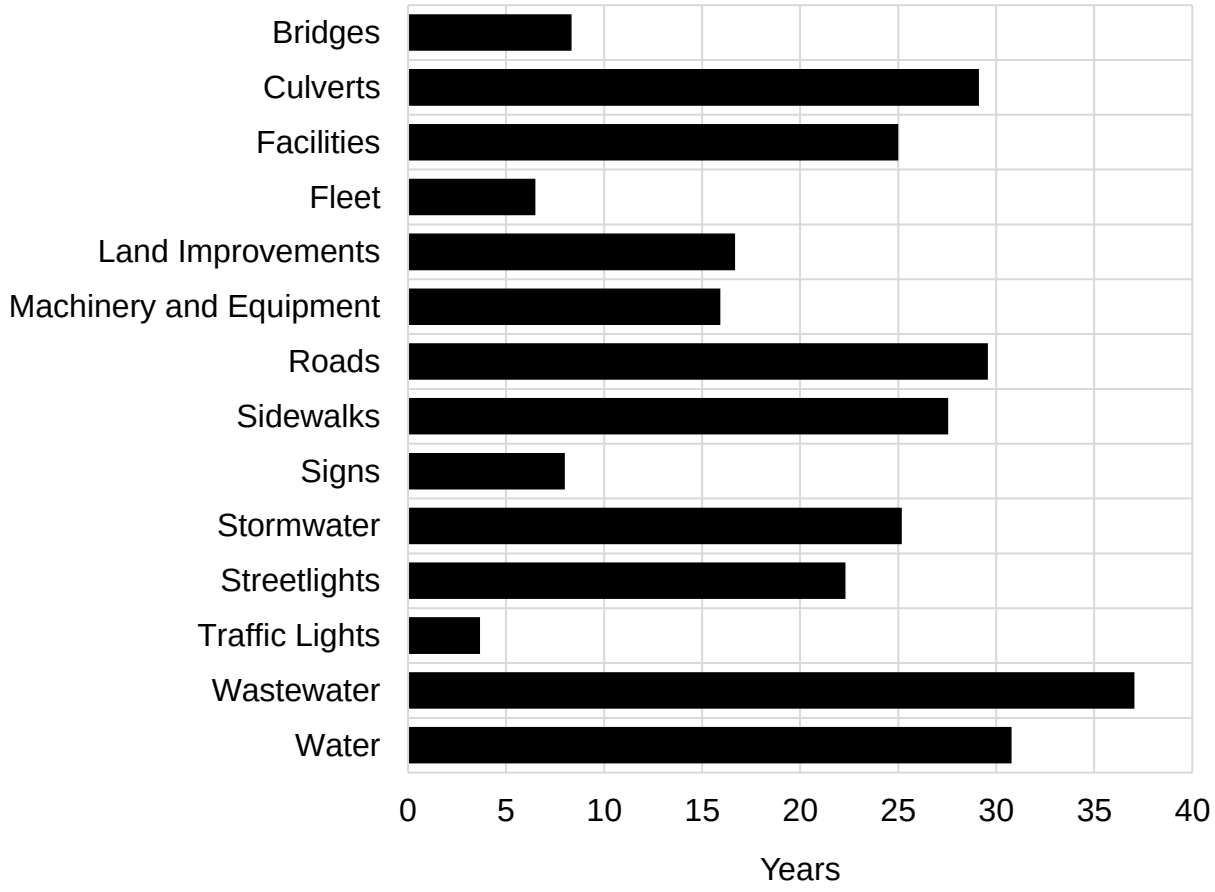
funding shortfall. Opportunities to fund the gap are explored in each section of the 2024 AMP, but it should be recognized that if the level of funding cannot be met, lifecycle activities must be deferred, or the level of service reduced.

1.6.2 Managing Aging Infrastructure

If the replacement needs of the portfolio cannot be achieved, infrastructure and other capital will continue to age and be at risk for reduced performance, increased likelihood of downtime, higher maintenance costs, and a higher cost for eventual replacement.

The average age for assets in the portfolio mirrors similar to the age-based condition (Figure 1-3) and is visualized in Figure 1-6 below.

Figure 1-6: Average Age



Regular investment in the portfolio is key to ensuring that aging infrastructure and other capital can continue to be replaced at a consistent rate to avoid the need for sudden spikes of investment in response to critical issues relating to performance or asset failure.

1.6.3 Maintaining Level of Service

Adjusting lifecycle activities for a category due to funding limitations is directly connected to the level of service provided. Assets that can no longer meet demand will be at risk of not meeting the expectations of the community and aging assets that are not replaced will begin to have reduced performance and a higher risk of failure. Reducing the frequency of operation and maintenance activities is linked to the daily performance of assets and the impact to service is likely to be immediate.

It is important to be mindful of projected increases in demand or growth. Both of these factors have financial implications to maintain the desired level of service. The projects identified as critical to sustaining the current level of service in response to an increase in demand or growth are:

- Water Pollution Control Plant Upgrade and Expansion, occurring 2024 to 2027.
- Operations Centre Expansion, projected for 2025.
- Trackless Compact Tractor, projected for 2029.
- Plow Truck, projected for 2030.
- Well #10, projected for 2034.

Considering a reduction in the level of service provided by a category must be closely weighed against the aspects of the service residents value and the quality of service delivery they expect, or that we are required to deliver through legislation.

1.6.4 Balancing Risk

Understanding the risk associated with asset lifecycle management is a critical component to decision making. Underfunded assets that remain in service longer will likely be at a higher risk of failure. Assets that do not receive necessary maintenance are more probable to experience downtime with a high cost for resolution.

For critical assets, such as Shelburne's arterial roads, winter control vehicles, or Water Pollution Control Plant, the impact to service in the event of failure would be immense. Alongside critical asset failure are consequences for the organization which are often costly, can have legal or compliance factors, and, depending on the nature of failure, the effect can be long-term.

As a result, it is important to prioritize investment in the portfolio based on an assessment of risk. Risk factors are discussed for each category throughout the 2024 AMP.

1.6.5 Future Demand

Projected or planned increases in demand have an impact on the resources required to maintain the level of service and as an extension, fund the asset lifecycle strategy.

As outlined in the Town of Shelburne Briefing Note to the Ministry of Infrastructure Delegation dated August 22, 2023, the Town is forecasted to add over 2,000 new homes for an estimated 5,500 additional residents by the year 2051. This will increase the Town's approximate 2023 population of 9,400 to over 15,000 as outlined in the County of Dufferin's Municipal Comprehensive Review in response to growth targets in accordance with the Growth Plan for the Greater Golden Horseshoe.

Reviewing the potential impacts of demand is a vital step for successful long-term asset lifecycle management.

1.7 Implementation and Next Steps

The 2024 AMP is intended to serve as a planning tool to support decision making for investment in capital assets over a 10-year period.

In the short-term following Council's adoption of the 2024 AMP, municipal staff will extract the data used to form the 2024 AMP and utilize it in conjunction with the development of the 2025 Annual Budget and an update to the Long-Term Capital Plan. This will ensure close alignment between these three documents.

Additionally, the 2024 AMP will provide leadership within each service area a clear projection of the lifecycle needs for their assets, which will assist with decision making and budgeting over the next several years.

Lastly, as the Town approaches the 2025 asset management plan requirements of O. Reg. 588/17, work will begin immediately with leadership from each service area and other stakeholders to begin the discussion and analysis of options for the level of service to be provided over the planning period of the 2025 AMP. The level of service objectives and performance measures presented in the 2024 AMP will be instrumental to the ongoing monitoring of service delivery and achieving customer expectations.

Section 2 – Definitions

2.1 Abbreviations and Acronyms

Figure 2-1: List of Abbreviations and Acronyms

Term	Description
AMP	Asset Management Plan
BCI	Bridge Condition Index
CCTV	Closed-Circuit Television
DMI	Distress Manifestation Index
GIS	Geographic Information System
HVAC	Heating, Ventilation, and Air Conditioning
ISO	International Organization for Standardization
MMS	Minimum Maintenance Standards
O. Reg.	Ontario Regulation
OCWA	Ontario Clean Water Agency
OSIM	Ontario Structure Inspection Manual
PCR	Pavement Condition Rating
PSAB	Public Sector Accounting Board
RCR	Ride Condition Rating

2.2 Definitions

"Amortization" means the allocation of the cost (less the residual value) of a tangible capital asset to operating periods as an expense over its useful life in a rational and systematic manner appropriate to its nature and use (PSAB 3150 Policies).

"Asset" is a tangible or intangible item or entity that has value to an organization. An asset may also refer to a group of assets, such as a tractor and its attachments.

"Asset Management" is the coordinated activity of an organization to realize value from assets (ISO 55000:2014). It is a business approach to minimize the cost of asset ownership while maintaining acceptable levels of service.

"Asset Management Program" refers to the activities of an organization to manage assets.

“Category” refers to a group of related assets. For example, the water category contains related assets such as water distribution mains, service lines, wells, and valves.

“Core Infrastructure Asset” means a municipal infrastructure asset that is a bridge, culvert, road, or relates to the conveyance of stormwater, wastewater, or water (Ontario Regulation 588/17).

“Field Condition Assessment/Inspection” is an on-site visual and detailed inspection of an asset or infrastructure.

“Level of Service” means the parameters, or combination of parameters, which reflect social, political, environmental and economic outcomes that the organization delivers (ISO 55000:2014). The level of service outlines the intended quality or quantity of the service that will be provided to the end user.

“Lifecycle Activities” refers to the activities and financial resources required to maintain an asset or group of assets from the time they enter service to their replacement.

“Segment” refers to the sub-category of assets within one asset category. For example, the fire hydrant or valve segment within the water asset category.

“Service Life” refers to an estimate of the number of years that an asset is expected to perform before requiring replacement.

“Stormwater” is the asset category for infrastructure involved in the management or conveyance of stormwater, such as that produced from a rainfall or melt event.

“Useful Life” refers to an estimate of the number of years that an asset is expected to perform before requiring replacement.

“Wastewater” is the asset category for infrastructure involved in the collection and treatment of wastewater, such as sewage.

“Water” is the asset category for infrastructure involved in the distribution of potable drinking water.

Section 3 – Introduction

Established in 1860, Shelburne is 6.5 square kilometers and comprised of urban and partial rural landscape. As of 2024, the Town manages a catalogue of over 10,000 unique assets with a replacement cost of over $163M as of 2024. From day-to-day operations to long-term financial planning, the ability for a municipality to make effective decisions for infrastructure and other capital investments rests on access to reliable and relevant asset data.

Asset management is a strategic business approach to the administration of capital assets. The goal of asset management is to minimize the cost of asset ownership, understand the risks associated with the management strategy, and maximize the value customers receive from assets and the essential services they provide.

3.1 Legislative Requirements

Filed under the Infrastructure for Jobs and Prosperity Act of 2015, O. Reg. 588/17 titled Asset Management Planning for Municipal Infrastructure sets forth the expectations and deadlines for municipalities to report on their asset management progress. The deadlines, inclusive of amendments as of June 2022, are outlined in Figure 3-1 below. Additionally, the date each document was adopted by Council has been included.

Figure 3-1: Ontario Regulation 588/17 Timelines

Reporting Document	Due Date	Adopted
Strategic Asset Management Policy	Jul 1, 2019	May 27, 2019
Asset Management Plan (Phase 1)	Jul 1, 2022	Jun 13, 2022
Asset Management Plan (Phase 2)	Jul 1, 2024	Jun 24, 2024
Asset Management Plan (Phase 3)	Jul 1, 2025	-

Phase 1 of the Asset Management Plan (AMP) series of updates focuses on core infrastructure assets which include bridges, culverts, roads, stormwater, wastewater, and water assets. Phase 2 encompasses all other infrastructure assets, while Phase 3 requires a detailed review of the level of service to be provided over a ten-year period.

Each update to the Town's AMP must be endorsed by the CAO and passed as a resolution through Council. Following completion of the Phase 3 update in July 2025, the Town is required to begin conducting an annual review of its asset management strategy with Council, as well as update its AMP every five years at minimum.

If asset management deadlines are not met, the Town is at risk of becoming ineligible to apply for many provincial and federal funding opportunities.

3.2 2024 Asset Management Plan

The goal of the 2024 AMP is to provide Council, staff, and the public with an understanding of the state of municipal infrastructure and the Town's asset management strategy. In addition to financial data, the AMP strives to communicate the connection between the asset lifecycle strategy, how it is connected to the level of service residents receive, and the risks associated with managing assets.

The AMP considers a 10-year planning period and should be regarded as a source of reference when weighing decisions regarding infrastructure, as well as in the development of financial and operational plans. The best available data is utilized to develop the AMP, and content is carefully reviewed by each service area to ensure a high level of credibility and alignment.

With this in mind, the purpose is not to provide a "locked in" strategy for managing infrastructure. Unpredictable events and expenses, such as legislative changes, can abruptly shift the Town's approach to managing infrastructure and these factors must be realized when reviewing an AMP.

3.3 Relationship to Existing Asset Management Policies and Plans

Shelburne's Strategic Asset Management Policy, passed in May 2019, was written with the purpose of guiding the Town's asset management activities to ensure ongoing compliance with O. Reg. 588/17 and to produce effective AMPs moving forward. This and future update to Shelburne's AMP, will adhere to the statements, roles, principles, and other applicable content found in the Strategic Asset Management Policy.

As a result of O. Reg. 588/17 outlining a three-phase approach for AMPs, the most recent AMP was passed in 2022 and excluded categories that were not required for the July 2022 deadline. The categories in scope were:

1. Bridges
2. Culverts
3. Roads
4. Stormwater
5. Wastewater
6. Water

This approach allowed the Town to develop a management strategy focused on a smaller range of assets that was evaluated for suitability before additional asset categories were brought into scope for the 2024 AMP.

Each AMP is intended to compliment the previous version. As the Town continues to develop its asset management program, more data is collected at a higher level of accuracy allowing for more complex analysis and modeling of asset lifecycle costs.

3.4 Alignment with Financial Planning Documents

The 2024 AMP is closely aligned with other financial planning documents. This is to ensure a clear and consistent presentation of long-term financial planning is presented in each document. As mentioned in section 1.2, related items include but is not limited to:

- Annual Budgets
- Long-Term Capital Plans
- Development Charges Studies

Each document includes a detailed assessment of long-term financial requirements to support capital assets. This data directly supports the development of the lifecycle strategy for each asset category in the 2024 AMP as it defines the timing and estimated cost for each lifecycle activity, as well as outlining the expected level of funding.

Additionally, the 2024 AMP supports the future development of financial planning documents. The asset lifecycle strategy found in the AMP outlines the year-by-year forecasting of expenditures and the estimated level of funding over the 10-year period to sustain the desired level of service. This data will be valuable as staff begin to update existing items such as the Annual Budget and Long-Term Capital Plan.

Although each of these documents reviews similar data, the level of detail included in each differs based on the document's intended purpose. For this reason, it is vital for these documents to be reviewed alongside each other to fully understand financial and operational approaches to the management of municipal infrastructure.

3.5 Data Availability and Limitations

Assembling an AMP requires data to be available from the Town's asset inventory. While the Town does maintain a robust catalogue of assets, some of the information stems from historical sources that predate the Town's current asset management strategy. Frequently, data from these sources is incomplete or otherwise inadequate for the standards currently followed by the Town, which requires staff to manually update the inventory asset-by-asset through a process involving the correction, validation, or sourcing of information. While typically straightforward, this process is time-consuming. As discussed in Section 3.3, this contributes to the reasoning behind introducing asset categories to subsequent updates of the AMP as they are required under Provincial Legislation rather than all at once.

Second, as asset data is improved, it is likely that future AMPs may present information relating to the quantity, replacement cost, and condition of asset categories that conflicts with previous versions of the same data. This would be the result of the

Municipality deploying data improvement initiatives which, in addition to correcting errors, build the framework for introducing more comprehensive asset management strategies such as utilizing cost-per-unit replacement cost methods or field inspected condition assessments rather than assumptions generated by software. Additionally, beginning in 2020, spikes in material and labour costs have occurred. It is highly probable the impact of this on estimated replacement costs will continue into the next AMP.

Third, Provincial Legislation dictates that certain sections of the AMP are permitted to be formed using asset data from up to two calendar years prior to the year in which the AMP is published. Instances of this have been deployed throughout the 2024 AMP. For example, if the Town is in possession of extensive asset information in the form of a report from an earlier year, this data may be used in lieu of or alongside current age-based data found in the asset inventory. All figures in this document are introduced with a note regarding the year of the data to communicate instances such as this.

Lastly, as required under O. Reg. 588/17, each AMP must indicate how the information used to assemble the quantity, average age, replacement cost, and condition statistics for each asset category will be made available to the public. Quantity and average age were calculated using data from the Town's asset inventory. Replacement cost and condition information was sourced from reports and studies publicly available on the Town of Shelburne website, from recent comparable capital projects, or from data generated by asset management software. Annual Audited Financial Statements are posted on the Town's website for exploring detailed asset valuation data. Additional information is available upon request. Data sourcing strategies as they relate to the preparation of this AMP are discussed in detail in Section 4.

Section 4 – Methodology

4.1 Quantity, Useful Life, and Age

The quantity and average age of each asset category was determined using data from the Town's asset management software. Quantity represents how many assets fall under each category, and average age is calculated by averaging the number of years the assets have been in service. In the inventory, each piece of infrastructure, or capital asset, is represented by one unique asset entry organized by a category and segment. This entry houses the financial, condition, and lifecycle data for one asset. Structuring the inventory in this way allows staff to export entire asset categories and perform calculations to summarize the quantity and average age. Some exceptions to this exist, as discussed in section 3.5.

The useful life for each segment represents an estimate of the number of years the infrastructure is expected to remain in service before requiring replacement. The Town's asset management program establishes the useful life that is to be used for each segment based on an assessment of the type of infrastructure, its material, and how similar assets have performed historically. As construction methods change, new materials are developed, and a larger number of assets are replaced and have their service life reviewed, the useful life for each segment may be increased or decreased as needed.

4.2 Condition and Replacement Cost

Asset condition and replacement cost was determined using two methods. First, the Municipality prepares and receives a wide range of reports and studies that review the Town's infrastructure. These documents typically include an assessment of the asset's condition as well as an estimate of the replacement cost often in the form of a cost-per-unit. Second, if the asset category was not included as part of a report or study, age-based condition assumptions and inflation-based replacement costs were generated by the Town's asset management software.

If a cost-per-unit or replacement cost was available for an asset category from a report or study, it was used to assemble the discussions and visualizations in this AMP. Occasionally, Shelburne's asset inventory contains missing or inadequate information for some assets due to the presence of older or improperly structured data sources. This may prevent Town staff from reliably assigning a cost-per-unit to the asset if critical information, such as a pipe's diameter or material, is missing or likely to be incorrect. In these situations, the historical cost for each asset was inflated to the applicable year as substitution for a defined replacement cost.

The condition of infrastructure followed a similar strategy to replacement cost. Reports often include field condition assessments of infrastructure by a member of staff or the Town's contract engineering firm. If a field condition assessment for a segment of assets was available, it was used to formulate condition information. In situations where a field condition assessment was not available, or if the asset it relates to could not be reliably located, the Town's asset management software estimated the condition of the asset based on the number of years remaining until it had depleted its useful life.

Some condition visualizations isolate assets that meet specific criteria, such as infrastructure with a condition rating or poor or lower. Occasionally, an asset category may not have an asset from each segment that satisfies the criteria. In this case, that segment would not appear in the visualization.

4.3 Level of Service

Level of service is used to structure an approach for outlining how an asset category must perform to meet the expectations of customers and the organization. It considers what aspects of the service are most valued by residents and introduces performance measures to serve as a monitoring framework to ensure the level of service being delivered is maintained.

Beginning in 2025, the AMP will include an assessment of level of service options, which will analyze in depth what is required financially and operationally to achieve the minimum, recommended, and best level of service.

4.4 Lifecycle Strategy

To manage capital assets, the Town develops a lifecycle strategy unique to each asset category. The strategy is intended to serve as a planning tool to understand the level of investment required to maintain or achieve the desired level of service.

At a high level, asset lifecycle is organized into three lifecycle activities:

- Acquisition
- Operation and Maintenance
- Replacement

Throughout the 2024 AMP, lifecycle activities are summarized by comparing the total projected expenditures to the total projected funding estimated to complete the activity. It should be noted that due to the AMP concerning a 10-year planning period that the confidence in later years (5-10) for when a lifecycle activity may occur and for what cost, particularly with acquisition and replacement activities, lessens. However, timing and financial estimates are based on the best available data.

Each lifecycle activity is discussed in detail below.

4.4.1 Acquisition

The acquisition lifecycle activity is the addition of a new asset to the inventory which did not previously exist.

Acquisitions do not replace existing assets and are typically forecasted in response to an increase in demand or due to growth. As a result, acquisitions are often cornerstone to maintaining the level of service long-term.

Additionally, acquisitions can be donated assets, such as through the assumption of a subdivision. It is important to note that donated assets do not require funding on the Town's behalf.

4.4.2 Operation and Maintenance

Operation and maintenance lifecycle activities support an asset while in service and enable it to meet the desired level of service.

Operation refers to activities that do not physically change the asset but are necessary for it to function. These may include items such as the cost of a study, inspection fees, the cost of utilities, and other overhead expenses.

Maintenance refers to activities that physically change the asset to retain its performance. This includes items such as repairing potholes on a road or flushing wastewater mains.

For additional clarity, operation and maintenance expenditures are organized into "primary" and "secondary". Primary expenditures are recurring expenses, such as those to support day-to-day operations. Secondary expenditures are non-recurring expenses, such as a Roads Needs Study conducted once every five years.

4.4.3 Replacement

The replacement lifecycle activity is to replace an asset at the end of its service life.

Asset replacement is directly linked to sustaining the level of service. As assets begin to age, their performance will reduce, the risk of failure will increase, and the costs for maintenance will be higher.

The 2024 AMP summarizes the replacement lifecycle activity by indicating expenditures for all replacements in each year of the planning period. This includes assets that staff have scheduled for replacement and assets from the inventory signaling for replacement based solely on their remaining useful life. The purpose of including assets based on age that staff have not scheduled for replacement is to communicate the reality that regular investment is necessary to maintain aging capital.

The replacement lifecycle activity also considers that an asset may need to be replaced more than once over the 10-year planning period. This is applicable to assets which utilize a shorter useful life, such as some fleet assets. If an expense is related to the second replacement of an asset, it is visualised on replacement overview charts as a "Next Replacement" expenditure. Including this data helps to more realistically model the necessary funding.

4.5 Risk Management

The risk management section for each asset category includes a high-level assessment of risk for critical assets. The purpose of this section is to gain an understanding of the potential impact to service delivery and consequences to the organization that could result in the event of asset failure. Additionally, the potential impacts of climate change are reviewed.

Assessing risk is an important step when weighing asset lifecycle decisions, particularly related to addressing a funding shortfall.

4.6 Recommendations

Each asset category is accompanied by a unique list of recommendations with the goal of improving the quality of the Town's asset management program. The suggestions reflect an informed assessment of the shortfalls that applies to each asset category or segment by municipal asset management staff, and which improvements would form the framework for the category to become more robust. Most commonly, this included linking the infrastructure to the Town's GIS and establishing a strategy for field condition assessments.

The recommendations found throughout this document are written with the intention of short-term implementation. Depending on the type of infrastructure, or the magnitude of missing or inadequate information, a suggestion could require multiple years to complete. Regardless of the timeline, as mentioned above, adhering to these guiding statements will contribute to bringing each asset category to where it can begin to participate in more developed phases of the Town's asset management program, such as such as field condition assessments, and be referenced reliably in the creation of long-term plans.

Section 5 – Bridges and Culverts

5.1 Quantity and Replacement Cost

Figure 5-1 showcases the quantity and replacement cost of assets within the bridge and culvert category.

Figure 5-1: Quantity and Replacement Cost (2024)

Segment	Quantity	Replacement Cost
Non-Structural Culverts	193	$245,968
Pedestrian Bridges	3	$620,308
Structural Culverts	7	$2,607,961
Total	**203**	**$3,474,237**

Replacement cost calculations reference a combination of cost-per-unit and inflation-based estimates. The cost-per-unit strategy uses the estimated material and construction costs to replace each structure as found in the 2022 Bridge and Culvert Inspection Action Report. This report is prepared every two years by the Town's contract engineering firm to provide a detailed assessment of structure condition as per applicable legislation.

While the unit costs found in the report could be applied to other bridge and culvert assets, roughly 95% of the non-structural culvert segment is missing information required to confidently assign a replacement value without first conducting a field inspection. This is due to much of the data stemming from older sources that predate the Town's current asset management strategy. Assets such as these were assigned a replacement cost by inflating their historical cost to 2024.

5.2 Age and Condition

5.2.1 Age

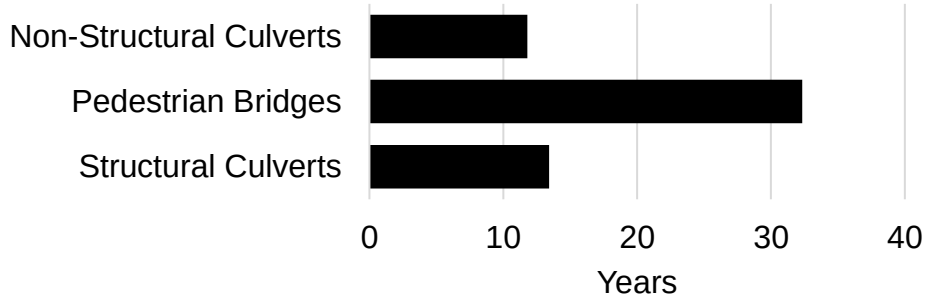
On the following page, Figure 5-2 highlights the useful life and average age for each segment. The average age is based on the number of years an asset has been in service, while the useful life is established by the Town's asset management program based on a reasonable estimate of how long the asset is expected to perform before requiring replacement.

Figure 5-2: Useful Life and Average Age (2024)

Segment	Useful Life	Average Age
Non-Structural Culverts	40 Years	29 Years
Pedestrian Bridges	50 Years	8 Years
Structural Culverts	50 Years	37 Years

Complimenting average age, Figure 5-3 showcases average remaining useful life below.

Figure 5-3: Average Remaining Useful Life (2024)



5.2.2 Condition

As mentioned in section 5.1, structural culverts and pedestrian bridges are assessed by the Town's contract engineering firm every two years as outlined in legislation. The condition assessment data included in the report is integrated into the Town's asset inventory for optimal condition modeling of pedestrian bridges and structural culverts.

One metric referenced in the report is the Bridge Condition Index (BCI). The BCI is described as a "…planning tool that helps the Ministry of Transportation schedule maintenance and upkeep". From the report, the BCI was split into the condition categories shown in Figure 5-4.

Figure 5-4: BCI Ranges

BCI Range	Condition
70-100	Good
60-70	Fair
Less than 60	Poor

To mirror the BCI ranges as closely as possible, Shelburne's asset management software utilizes a unique five-step condition rating scale for bridge and culvert assets, which is found in Figure 5-5 below.

Figure 5-5: Condition Rating Scale

Condition	Rating	Description
Very Good	90.00 and above	Maintenance work is not usually required within the next five years.
Good	70.00 and above	Maintenance work is not usually required within the next five years.
Fair	60.00 and above	Maintenance work is usually scheduled within the next five years.
Poor	20.00 and above	Maintenance work is usually scheduled within approximately one year.
Very Poor	0.00 and above	Maintenance work is usually scheduled within approximately one year.

A summary of asset condition is found below. Assets in scope of the 2022 Bridge and Culvert Inspection Action Report that received a field inspection are visualized in Figure 5-6 while assets with a condition rating solely based on their age are separated into Figure 5-7 on the following page. The estimated replacement cost for each asset or segment of assets has been included in each visual.

Figure 5-6: Field Inspection Condition Rating (2022)

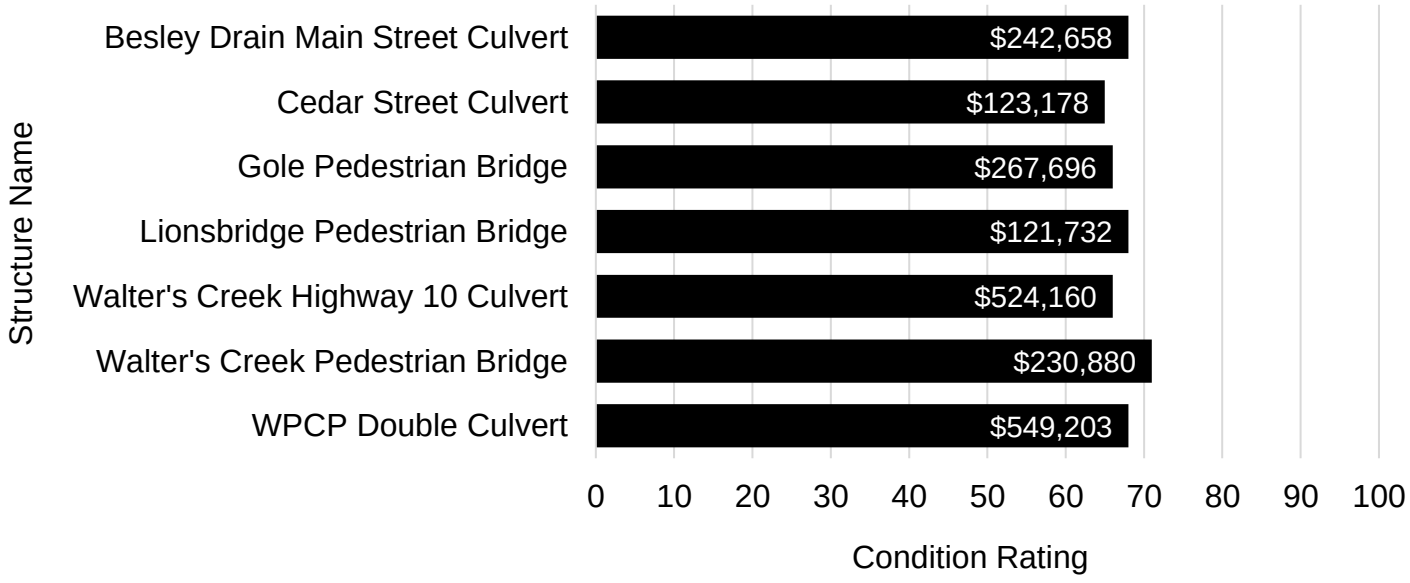
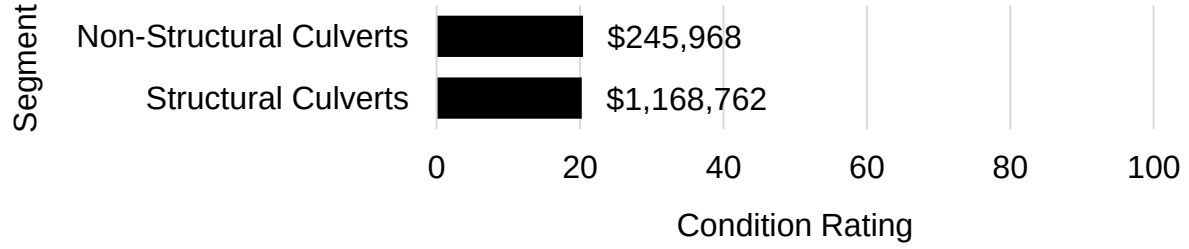


Figure 5-7: Average Age-Based Condition Rating (2024)



5.3 Level of Service

Bridge and culvert assets support many other categories such as transportation and stormwater. Therefore, understanding the performance of bridge and culvert assets is an important step in determining the appropriate level of service.

5.3.1 Level of Service Objectives

The purpose of level of service objectives is to qualitatively describe the elements of bridge and culvert assets that residents value. Each description, or statement, is linked to a relevant service parameter which is used to maintain linkage throughout the level of service discussion.

Figure 5-8 suggests applicable level of service objectives for bridges and culverts.

Figure 5-8: Level of Service Objectives

Service Parameter	Objective Statement
Capacity	Bridges and culverts are utilized in all necessary areas of the community.
Quality	Bridges and culverts are safe and aesthetically pleasing.
Reliability	Bridges and culverts are maintained to minimize the likelihood of downtime.
Responsiveness	Municipal staff are available for questions and assistance.

5.3.2 Performance Measures

Performance measures are utilized to translate the qualitative level of service objective statements into quantitative long-term indicators of whether the level of service is being achieved.

Refinement and data collection for performance measures is underway to ensure suitability for the July 1, 2025 requirements of Ontario Regulation 588/17. As a result,

further discussion surrounding the current and target performance of each measure has been excluded for bridge and culvert assets from the 2024 Asset Management Plan.

Please refer to section 5.3.1, 5.3.2, and 5.3.3 for more information regarding the Town's approach to measuring the performance of bridge and culvert assets.

Below, Figure 5-9 displays applicable performance measures.

Figure 5-9: Performance Measures

Service Parameter	Performance Measure	Target
Reliability	Percent of structures with a BCI of 60 or better.	100%
Reliability	Percent of structures assigned a load restriction that is abnormal for the structure's rated capacity.	0%
Responsiveness	Time for municipal staff to respond to a customer inquiry.	1 business day

5.3.3 Legislated Performance Measures

Ontario Regulation 588/17 outlines specific performance measures for bridge and culvert assets. It should be noted that legislation uses the terminology "service attribute" in place of "service parameter". For consistency with other categories in the 2024 Asset Management Plan, "service parameter" will be referenced.

Below, Figure 5-10 begins the discussion with technical performance measures.

Figure 5-10: Legislated Technical Performance Measures

Service Parameter	Performance Measure	Performance (2022, 2024)
Scope (Capacity)	Percentage of bridges in the Municipality with loading or dimensions restrictions.	0%
Quality	For bridges in the Municipality the average bridge condition index value.	68.3
Quality	For structural culverts in the Municipality, the average bridge condition index value.	66.8

In the above figure, scope service parameters utilize data from 2024, while quality service parameters reference data from 2022.

Below, Figure 5-11 continues with legislated community performance measures.

Figure 5-11: Legislated Community Performance Measures

Service Parameter	Performance Measure	Performance (2022, 2024)
Scope	Description of the traffic that is supported by municipal bridges.	As of 2024, Shelburne maintains an inventory of three pedestrian bridges. Each bridge provides connectivity along the Town's sidewalk and trail networks supporting leisure and recreational activities for pedestrians.
Quality	Description or images of the condition of bridges and how this would affect use of the bridges.	The 2022 Bridge and Culvert Inspection Action Report identified 1 of 3 bridges to be in fair condition with a BCI of 71, and 2 of 3 bridges to be in good condition with BCIs of 68 and 66. Suggested maintenance items included the installation or upgrading of railings and approach grading. The recommended timeline for these items ranged from 1 to 5 years. These condition notes do not impact the usability of bridges.
Quality	Description or images of the condition of structural culverts and how this would affect use of the structural culverts.	The 2022 Bridge and Culvert Inspection Action Report noted structural culverts to be in fair condition with BCIs ranging from 65 to 68. Recommended maintenance to be performed within 1 to 5 years included items such as the repair of gabion baskets, installation of hazard markers, and clearing of vegetation. The condition rating of these structural culverts does not impact their usability.

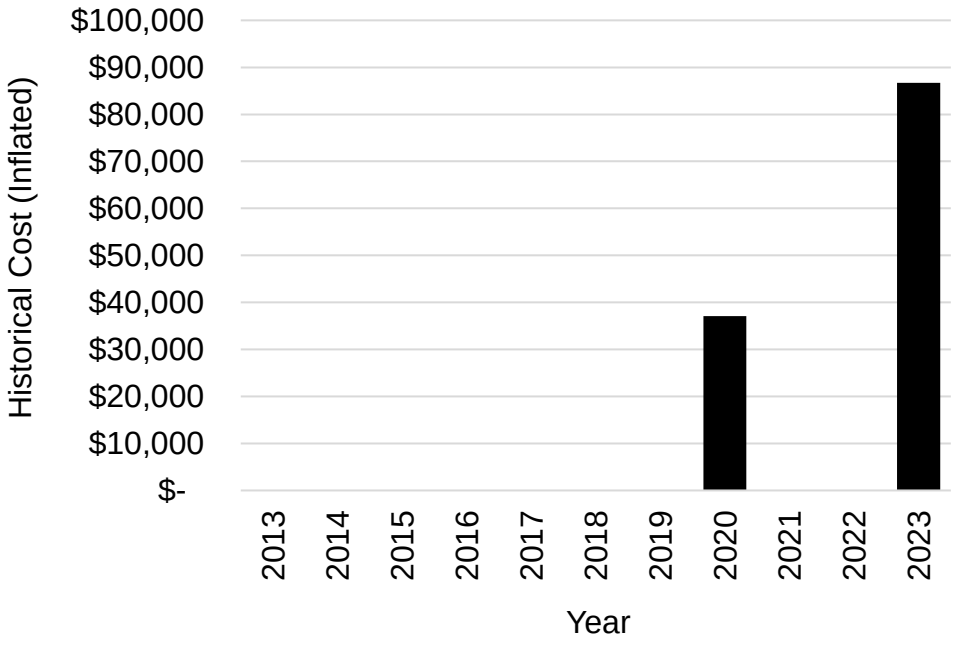
5.4 Lifecycle Strategy

The lifecycle strategy guides the Town's approach to managing bridge and culvert assets long-term and provides important insight as to the projected level of funding required.

5.4.1 Recent Investment

To provide context for the lifecycle strategy, Figure 5-12 showcases recent investment over the past 10 years. The figure only concerns acquisitions and replacement transactions. Additionally, the historical cost of each asset has been inflated to the year 2024 to ensure standardization.

Figure 5-12: Recent Investment Overview



Examining the overview, there are only two instances of recent investment over the last 10 years. These were related to:

- Donated acquisition of the Summerhill subdivision in 2020, bringing the Walter's Creek Pedestrian Bridge and other culvert assets into service.
- Asset inventory maintenance in which it was noticed that the Lionsbridge Pedestrian Bridge was missing from inventory. This bridge should have been added in 2020 alongside the assumption of the Summerhill subdivision.

5.4.2 Acquisition

Over the 10-year planning period, there are no forecasted acquisitions for the bridges and culverts asset category.

There is potential for culverts to be in scope of the infrastructure that will be acquired through the assumption of the Emerald Crossing and Hyland Village subdivisions, estimated to occur in 2025 and 2026. Occasionally, culverts are hidden in stormwater or landscape works in asset valuation documentation and are not identified until as-constructed drawings are reviewed.

Should any culvert assets be assumed with the subdivisions in 2025 or 2026, it is important to remember that donated assets do not require funding for acquisition. However, it should be expected that an increase in the level of investment for operation and maintenance will be required, and for the eventual replacement.

The lifecycle strategy continues on the following page with operation and maintenance.

5.4.3 Operation and Maintenance

The operation and maintenance forecast was assembled through consultation with staff and connected to financial data in the 2024 Adopted Budget.

Below, Figure 5-13 highlights projected operation expenditures.

Figure 5-13: Projected Operation Expenditures

Planning Period	Year	Primary Expenditures	Secondary Expenditures	Total Projected Expenditures	Projected Funding	Balance
Year 0	2024	$2,500	$7,500	$10,000	$10,000	$0
Year 1	2025	$2,550	$0	$2,550	$2,550	$0
Year 2	2026	$2,601	$7,800	$10,401	$10,401	$0
Year 3	2027	$2,653	$0	$2,653	$2,653	$0
Year 4	2028	$2,706	$8,112	$10,818	$10,818	$0
Year 5	2029	$2,760	$0	$2,760	$2,760	$0
Year 6	2030	$2,815	$8,436	$11,252	$11,252	$0
Year 7	2031	$2,872	$0	$2,872	$2,872	$0
Year 8	2032	$2,929	$8,774	$11,703	$11,703	$0
Year 9	2033	$2,988	$0	$2,988	$2,988	$0
Year 10	2034	$3,047	$9,125	$12,172	$12,172	$0
Total		**$30,422**	**$49,747**	**$80,169**	**$80,169**	**$0**

Figure 5-14 outlines projected maintenance expenditures.

Figure 5-14: Projected Maintenance Expenditures

Planning Period	Year	Primary Expenditures	Secondary Expenditures	Total Projected Expenditures	Projected Funding	Balance
Year 0	2024	$1,000	$39,827	$40,827	$40,827	$0
Year 1	2025	$1,020	$48,151	$49,171	$1,020	-$48,151
Year 2	2026	$1,040	$44,712	$45,752	$1,040	-$44,712
Year 3	2027	$1,061	$0	$1,061	$1,061	$0
Year 4	2028	$1,082	$0	$1,082	$1,082	$0
Year 5	2029	$1,104	$0	$1,104	$1,104	$0
Year 6	2030	$1,126	$0	$1,126	$1,126	$0
Year 7	2031	$1,149	$0	$1,149	$1,149	$0
Year 8	2032	$1,172	$0	$1,172	$1,172	$0
Year 9	2033	$1,195	$0	$1,195	$1,195	$0
Year 10	2034	$1,219	$0	$1,219	$1,219	$0
Total		**$12,169**	**$132,690**	**$144,859**	**$51,996**	**-$92,863**

On the following page, the operation and maintenance overviews are found as Figure 5-15 and 5-16.

Figure 5-15: Operation Overview

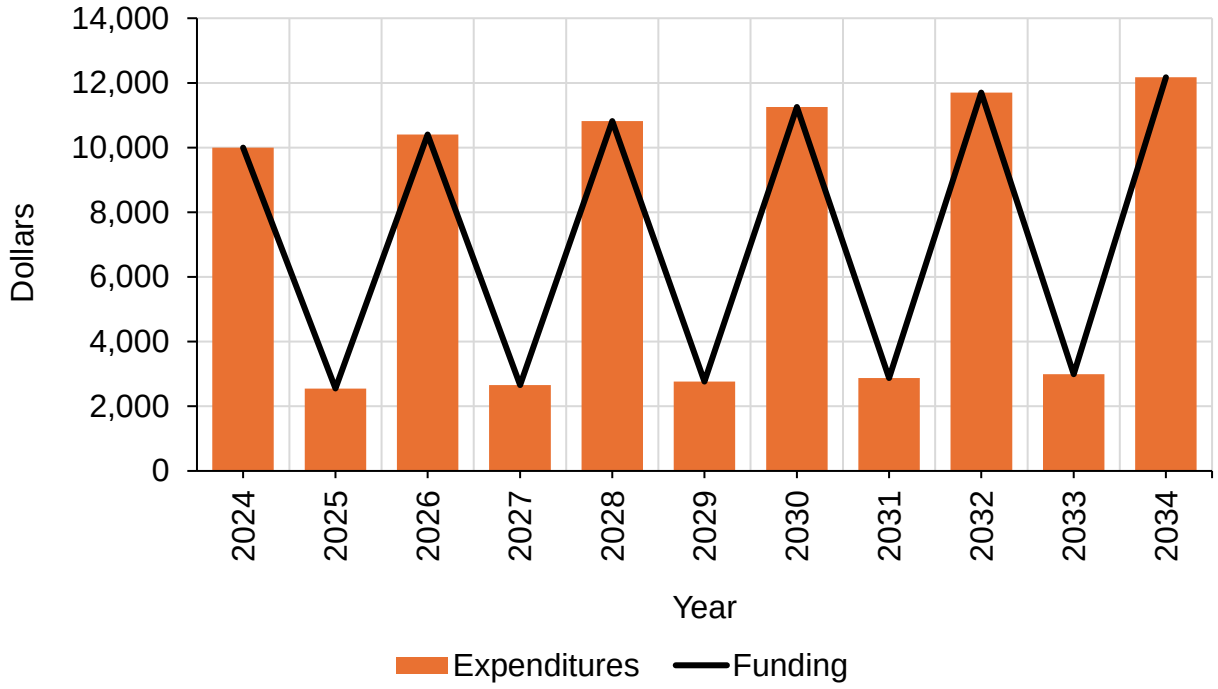
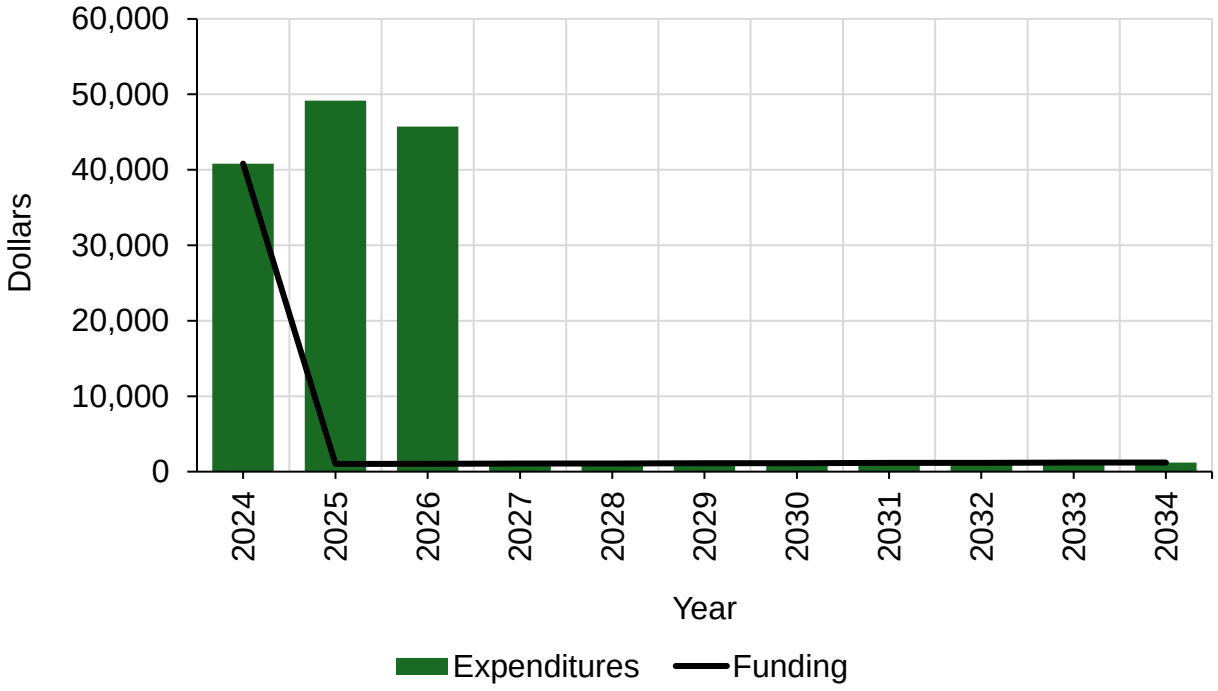


Figure 5-16: Maintenance Overview



On the following page, an example of the recurring operation and maintenance activities for bridge and culvert assets are outlined as Figure 5-17 and 5-18.

Figure 5-17: Operation Activities

Segment	Activity	Interval	Description	Purpose
Structural Culverts Pedestrian Bridges	OSIM Inspection	2 Years	Detailed visual inspection of structures to identify deficiencies and recommend maintenance strategies.	Legislative compliance and prolonged life of infrastructure.

Figure 5-18: Maintenance Activities

Segment	Activity	Interval	Description	Purpose
Non-Structural Culverts	Preventative Maintenance	As Needed	Non-structural culverts are inspected for structural integrity and debris buildup.	Improved conveyance of stormwater and prolonged life of infrastructure.

Overall, the operation and maintenance lifecycle activity closes with a funding shortfall of $92,863. This is due to non-recurring expenses (secondary expenditures) for maintenance that are unfunded 2025 to 2026. These expenditures are to support the structure maintenance recommended in the 2022 Bridge and Culvert Inspection Action Report. Below, Figure 5-19 highlights the recommended structure maintenance.

Figure 5-19: Projected Secondary Maintenance Expenditures

Year	Asset ID	Structure Name	Projected Cost
2024	13187	Gole Pedestrian Bridge	$2,751
2024	215	Walter's Creek Highway 10 Culvert	$37,076
2025	217	Besley Main Street Culvert	$6,705
2025	221	Cedar Street Culvert	$36,570
2025	21610	Walter's Creek Pedestrian Bridge	$4,876
2026	216	WPCP Double Culvert	$37,260
2026	22144	Lionsbridge Pedestrian Bridge	$7,452

5.4.4 Replacement

The replacement lifecycle activity was forecasted using age-based data for each asset. This is due to the fact there are not currently any capital bridge or culvert assets planned or recommended for replacement.

Additionally, the Town is currently in the process of improving the quality of bridge and culvert assets in the inventory. As a result, the majority of low-value, non-structural culverts exist in the inventory with no location information. This presents challenges when using age to forecast asset replacements.

Ultimately, the assets showing in need of replacement due to age, despite having absent location information, have been included in the replacement forecast. This is to ensure the required level of funding can be represented to articulate the need for regular investment to support aging bridge and culvert assets.

Figure 5-20 highlights one projected upcoming replacement based on asset age. This asset was selected for the figure due to having location information available.

Figure 5-20: Projected Upcoming Replacements

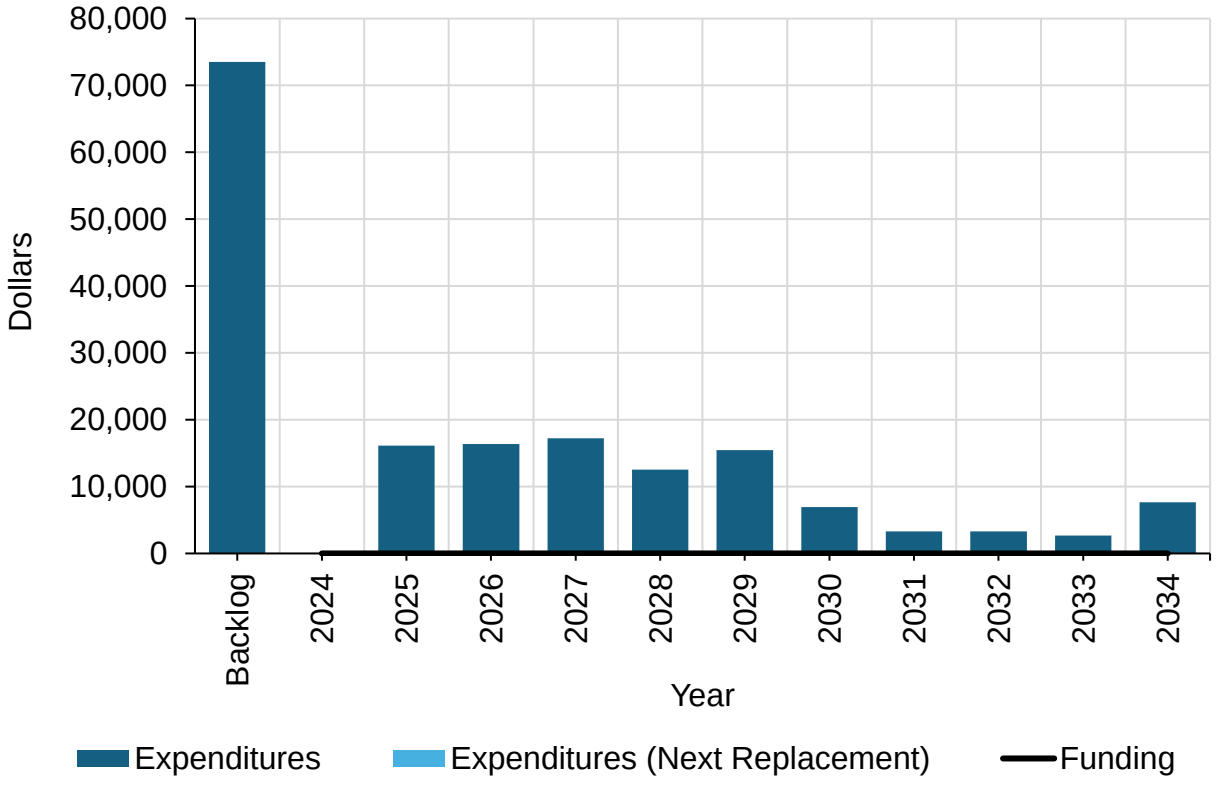
Year	Asset ID	Description	Projected Cost
Backlog	219	Rail Trail Structural Culvert	$51,124

Projected replacement expenditures are found on the following page as Figure 5-19. Additionally, the replacement overview is displayed in Figure 5-21.

Figure 5-21: Projected Replacement Expenditures

Planning Period	Year	Projected Expenditures	Projected Funding	Balance
Backlog	Backlog	$73,496		-$73,496
Year 0	2024	$0	$0	$0
Year 1	2025	$16,136	$0	-$16,136
Year 2	2026	$16,384	$0	-$16,384
Year 3	2027	$17,248	$0	-$17,248
Year 4	2028	$12,551	$0	-$12,551
Year 5	2029	$15,464	$0	-$15,464
Year 6	2030	$6,955	$0	-$6,955
Year 7	2031	$3,279	$0	-$3,279
Year 8	2032	$3,306	$0	-$3,306
Year 9	2033	$2,682	$0	-$2,682
Year 10	2034	$7,656	$0	-$7,656
Total		**$175,157**	**$0**	**-$175,157**

Figure 5-22: Replacement Overview



5.4.5 Lifecycle Overview

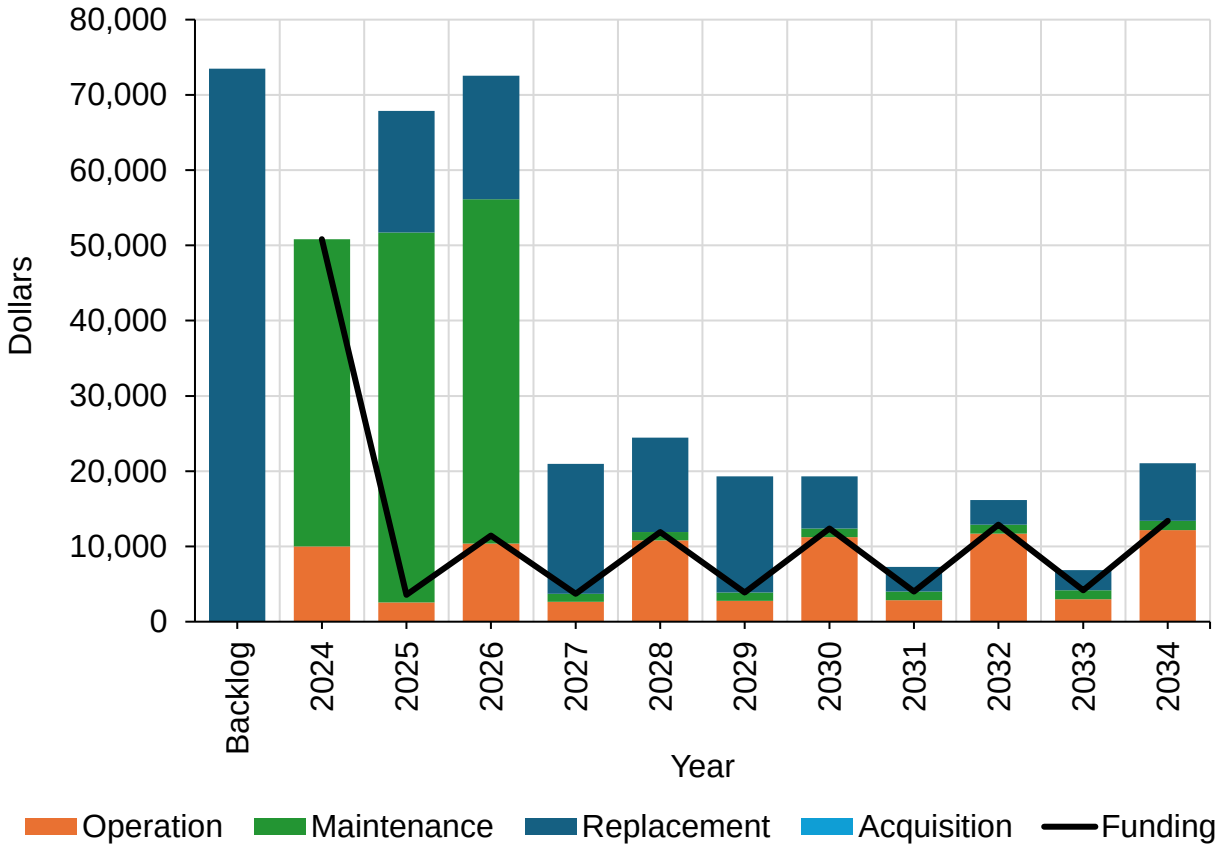
Visualizing all elements of the lifecycle strategy, Figure 5-23 showcases the projected lifecycle expenditures.

Figure 5-23: Projected Lifecycle Expenditures

Planning Period	Year	Acquisition	Operation	Maintenance	Replacement	Total Expenditures	Total Funding	Balance
Backlog	Backlog	$0			$73,496	$73,496		-$73,496
Year 0	2024	$0	$10,000	$40,827	$0	$50,827	$50,827	$0
Year 1	2025	$0	$2,550	$49,171	$16,136	$67,857	$3,570	-$64,287
Year 2	2026	$0	$10,401	$45,752	$16,384	$72,537	$11,441	-$61,096
Year 3	2027	$0	$2,653	$1,061	$17,248	$20,962	$3,714	-$17,248
Year 4	2028	$0	$10,818	$1,082	$12,551	$24,452	$11,901	-$12,551
Year 5	2029	$0	$2,760	$1,104	$15,464	$19,328	$3,864	-$15,464
Year 6	2030	$0	$11,252	$1,126	$6,955	$19,333	$12,378	-$6,955
Year 7	2031	$0	$2,872	$1,149	$3,279	$7,299	$4,020	-$3,279
Year 8	2032	$0	$11,703	$1,172	$3,306	$16,181	$12,875	-$3,306
Year 9	2033	$0	$2,988	$1,195	$2,682	$6,865	$4,183	-$2,682
Year 10	2034	$0	$12,172	$1,219	$7,656	$21,047	$13,391	-$7,656
Total		**$0**	**$80,169**	**$144,859**	**$175,157**	**$400,185**	**$132,165**	**-$268,020**

The lifecycle overview is displayed as Figure 5-24 below.

Figure 5-24: Lifecycle Overview



Overall, the lifecycle strategy for bridges and culverts concludes with a projected funding gap of $268,020. As discussed, this is due to the presence of unfunded secondary maintenance expenditures in 2025 and 2026, as well as age-based replacements throughout the planning period.

To improve the usefulness of the lifecycle strategy, it is vital that the Town continues to refine the data available in the asset inventory. Historical data entry practices which predate the Town's current approach to asset management have resulted in many assets in the inventory, typically low in value, that cannot be linked to a real-world item due to missing information.

This presents several challenges associated with modeling the lifecycle of the category, but it more importantly is a barrier to utilizing the bridge and culvert asset inventory as a reliable source of data for long-term planning.

5.5 Risk Management

Bridge and culvert assets are key to supporting a range of municipal services. In addition to having a role in transportation and stormwater management, bridges and culverts aid in recreation services by allowing trail networks to pass watercourses, and ensuring groundwater is safely managed around play areas. For this reason, it is important that risk is assessed when making investment decisions regarding the bridges and culverts asset category.

5.5.1 Critical Assets

Critical assets are defined as those which will have the highest impact to service and result in the greatest consequence to the organization in the event of failure. Figure 5-25 provides examples of critical bridge and culvert assets.

Figure 5-25: Critical Assets

Segment	Critical Asset
Structural Culverts	Besley Drain Main Street Culvert
Structural Culverts	Walter's Creek Highway 10 Culvert

5.5.2 Risk Assessment

The lifecycle strategy for bridges and culverts indicates a funding shortfall for multiple years of the planning period. To manage the funding gap, adjustments to the level of funding will need to be reviewed, including the possible deferral of a lifecycle activity. When evaluating whether to defer an activity, it is important to recognize the risk that may be introduced. Figure 5-26 outlines potential risk.

Figure 5-26: Lifecycle Activities and Potential Risk

Deferred Activity	Potential Risk
Acquisition	▪ Increased likelihood of exceeding capacity for water volume ▪ Increased likelihood of frequent deficiencies due to over capacity
Operation and Maintenance	▪ Increased likelihood of unresolved deficiencies ▪ Increased likelihood of safety issues ▪ Increased likelihood of reduced aesthetics ▪ Increased likelihood of reduced performance
Replacement	▪ Increased likelihood of downtime due to age ▪ Increased likelihood of decreased performance due to age ▪ Increased likelihood of higher maintenance costs due to age ▪ Increased likelihood of higher replacement costs due to age

5.5.3 Potential Service Impact

In the event of critical asset failure, a disruption to service would result. Below, Figure 5-27 outlines potential impacts to service.

Figure 5-27: Potential Service Impacts

Critical Asset	Potential Service Impact
Besley Drain Main Street Culvert	▪ Main Street East forced to close between Greenwood Street and Simon Street. ▪ Immense disruption to local and regional traffic flow. ▪ Significant disruption and strain on collector roads for traffic detour. ▪ Risk of reduced response time for emergency services. ▪ Reduced or blocked conveyance of watercourse beneath structure, resulting in upstream flooding. ▪ Upstream flooding results in damage to immediate natural area, potentially nearby infrastructure, and possible private property.
Walter's Creek Highway 10 Culvert	▪ Owen Sound Street forced to close between Fiddle Park Lane and Col Phillips Drive. ▪ Immense disruption to local and regional traffic flow. ▪ Risk of reduced response time for emergency services. ▪ Significant disruption and strain on collector roads for traffic detour. ▪ Reduced or blocked conveyance of watercourse beneath structure, resulting in upstream flooding. ▪ Upstream flooding results in damage to immediate natural area, potentially nearby infrastructure, and possible private property.

5.5.4 Potential Consequences

In addition to disrupting services, the failure of a critical asset brings consequences for the organization. Figure 5-28 explores potential consequences.

Figure 5-28: Potential Consequences

Consequence Type	Likelihood
Environmental	Likely
Financial	Likely
Health/Safety	Unlikely
Legal/Compliance	Likely
Operational	Unlikely
Reputational	Likely
Service Delivery	Likely

5.5.5 Climate Change

Factors related to climate change have the potential to impact the Town's management of bridge and culvert assets. To explore this further, Figure 5-29 outlines potential impacts of climate change and the risk to the lifecycle strategy that can be introduced.

Figure 5-29: Climate Change Risks

Factor	Potential Impact	Potential Lifecycle Risk
Frequency of Severe Weather	▪ Increase frequency of high rainfall events resulting in flooding. ▪ Increased risk of damage to assets from water volume.	▪ Higher maintenance costs due to increased frequency of repairs. ▪ Higher acquisition and replacement costs for infrastructure with higher capacity.
Higher Average Temperatures	▪ Increased heat stress on asphalt roads and concrete structures. ▪ Increased expansion/contraction of materials.	▪ Higher maintenance costs to manage increase wear and tear. ▪ Higher acquisition and replacement costs for more resilient assets.
Seasonal Weather Variance	▪ Increased frequency of freeze/thaw cycles. ▪ Increased expansion/contraction of materials.	▪ Higher maintenance costs to manage increased wear and tear. ▪ Higher acquisition and replacement costs for more resilient assets.

5.6 Recommendations

As a result of legislated structure inspections, the bridge and culvert categories present a mixture of assets with highly detailed condition and replacement cost information, and assets with missing or significant information gaps. To improve the applicability of the category for long term planning, the below recommendations are listed.

First, continue to focus on linking culvert assets in the inventory to known infrastructure in the Town's GIS database. A strategy to reasonably estimate which culvert in the inventory corresponds to which culvert on the ground must first be developed as linking each structure will require assumptions due to limited information in the inventory.

Second, as culvert assets are linked to the GIS database, establish a strategy to assess the condition and verify each is still in service. While many are low in value, these assets play an important role in the conveyance of stormwater and support reporting capabilities for legislative stormwater compliance.

Section 6 – Facilities

6.1 Quantity and Replacement Cost

Facility assets are best showcased by their related service area. Figure 6-1 highlights the quantity and replacement cost of each.

Figure 6-1: Quantity and Replacement Cost (2024)

Service Area	Asset Quantity	Structure Quantity	Replacement Cost
Administration	32	1	$5,665,692
Parks & Recreation	7	7	$2,857,314
Operations	8	4	$2,973,776
Total	**47**	**12**	**$11,496,782**

For facilities, a "Structure Quantity" column has been included in the figure. The Town strives to record structures in the asset inventory as multiple assets representing components such as shell, HVAC, roof, etc. This results in a single structure having a multitude of assets, such as the Town Hall segment. This strategy enables the Town to more effectively manage each part of the facility and apply a unique service life to each component. While most structures have been recorded following this workflow, some exist in the inventory as one asset representing the entire building. This is due to historical data entry which predates the Town's current approach to asset management.

It is important to note that while owned by the Town, including the land which they are located on, the following facilities are not reviewed in the 2024 Asset Management Plan:

- Centre Dufferin Recreation Complex
- Shelburne and District Fire Department
- Shelburne Public Library
- Shelburne Curling Club

These facilities are governed by separate boards of management and the Town of Shelburne has no direct care and control over these properties and their related assets.

Additionally, structures within the below two service areas are discussed in the corresponding section for each asset category.

- Wastewater
- Water

Replacement cost has been calculated using a mixture staff estimates and inflated historical cost. For the Administration service area, 88% of structures reference an inflated historical cost for replacement cost while 13% utilize staff estimates. For the Parks and Recreation service area, 29% of structures reference an inflated historical cost for replacement cost while 71% utilize staff estimates. For the Operations service area, 100% of structures reference staff estimates for replacement cost.

Replacement costs calculated from staff were guided by multiple sources of reference such as valuations for similar structures or invoices for recent components.

6.2 Age and Condition

6.2.1 Age

There is wide variation in the useful life found in the facilities area. Similar components will often share the same useful life, such as lighting, but different facilities many require a different grade of components, such as a larger HVAC system at Town Hall compared to a smaller structure. Figure 6-2 showcases the service life assigned to each component as well as the average age as of 2024.

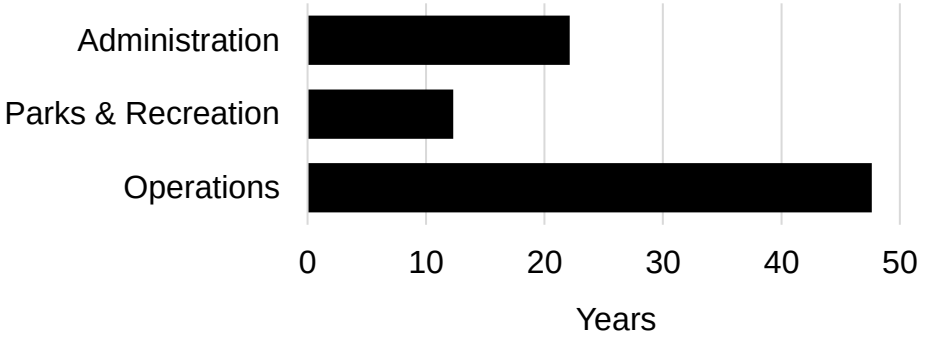
Figure 6-2: Useful Life and Average Age (2024)

Component	Useful Life	Average Age
Exterior Doors	30-40 Years	11 Years
HVAC	15-50 Years	51 Years
Lighting	25 Years	24 Years
Roof	20-60 Years	34 Years
Shell	100 Years	51 Years

It should be noted that summarizing the useful life and average age of components involved assuming that if a structure is not split into individual components in the inventory that all components of the building share one in-service date. For example, a public washroom entered as a single asset is assumed to have a roof with the same construction date.

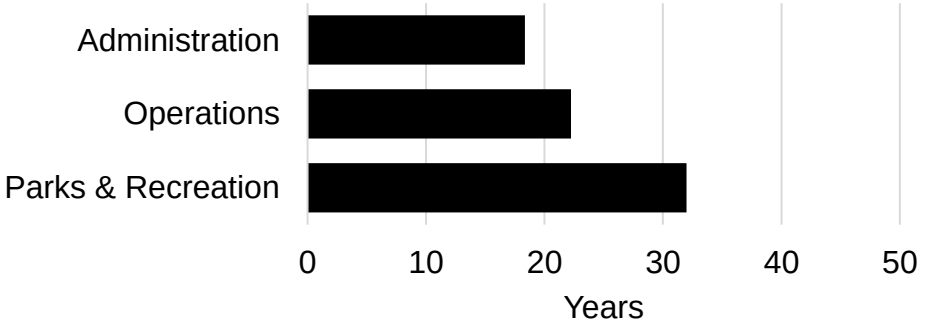
Figure 6-3 highlights the average age of facilities assets by service area as of 2024.

Figure 6-3: Average Age (2024)



Complimenting the average age, Figure 6-4 displays the average remaining useful life of assets within each service area.

Figure 6-4: Average Remaining Useful Life (2024)



6.2.2 Condition

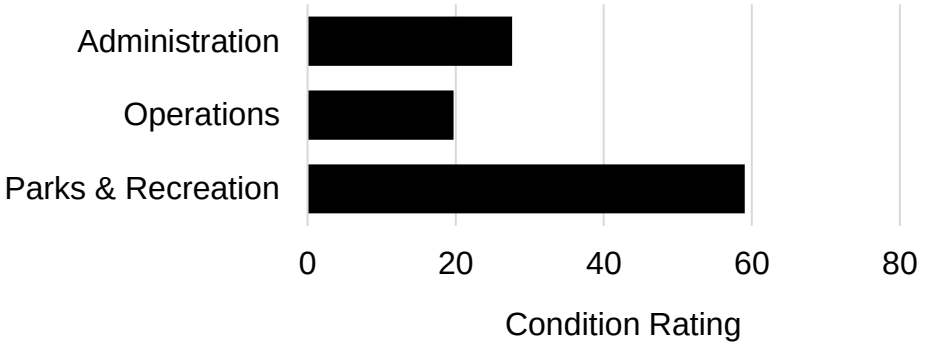
In the asset inventory, the condition data for facility assets is limited to an age-based condition rating. While other condition assessments are conducted as needed, the Town has not yet developed a strategy to incorporate external condition rating data into the inventory. As the Town's asset management program continues to advance, developing such a strategy will be prioritized.

The condition scale for facilities is shown in Figure 6-5, and the average age-based condition rating as of 2024 by service area is highlighted in Figure 6-6.

Figure 6-5: Condition Rating Scale

Condition	Rating
Very Good	80.00 and above
Good	60.00 and above
Fair	40.00 and above
Poor	20.00 and above
Very Poor	0.00 and above

Figure 6-6: Average Age-Based Condition Rating (2024)



Similar to other asset categories, it is important to understand that age-based condition ratings are intended as a high-level estimate of the condition each item. In the context of facilities, many components of a structure can be maintained, meaning elements with a low age-based condition rating may in fact be in fair or good condition.

6.3 Level of Service

From administrative offices and workshops to park pavilions and theatres, our facilities enable essential services to be provided for both the organization and the community.

Understanding the expectations of residents and the requirements of our organization is the first step to ensuring the correct level of service is achieved.

6.3.1 Level of Service Objectives

The level of service objectives set the course for defining the level of service. These objectives are qualitative statements that reflect the values of customers and the organization at a high level. Each objective is categorized into a relevant service parameter.

Figure 6-7 showcases applicable objectives.

Figure 6-7: Level of Service Objectives

Service Parameter	Objective Statement
Accessibility	Facilities are designed to be accessible for all users.
Availability	Facilities are reasonably distributed throughout the community.
Capacity	Facilities meet the needs of the community and staff.
Quality	Facilities are maintained to a high degree of cleanliness and performance.
Reliability	Facility downtime is minimized by good maintenance practices.
Responsiveness	Municipal staff are available for questions and assistance.

Level of service discussions resume on the following page with performance measures.

6.3.2 Performance Measures

Defining performance measures bridges the qualitative level of service objectives to the level of service provided. Each performance measure is linked to the service parameters that represent the values of users.

Figure 6-8 outlines applicable performance measures.

Figure 6-8: Performance Measures

Service Parameter	Performance Measure
Accessibility	Percent of facilities that meet AODA standards.
Availability	Average distance to reach 100 households.
Capacity	Number of forecasted acquisitions due to growth that are unfunded.
Quality	Average Facility Condition Index (FCI).
Reliability	Number of unplanned facility closures per year.
Responsiveness	Municipal staff response time to customer inquiries.

Refinement and data collection for performance measures is currently underway to ensure suitability for the July 1, 2025 requirements of Ontario Regulation 588/17. As a result, the current and target performance of each measure has been excluded for facilities from the 2024 Asset Management Plan.

Please refer to section 6.3.1 and 6.3.2 for the Town's approach to measuring the performance of facility assets.

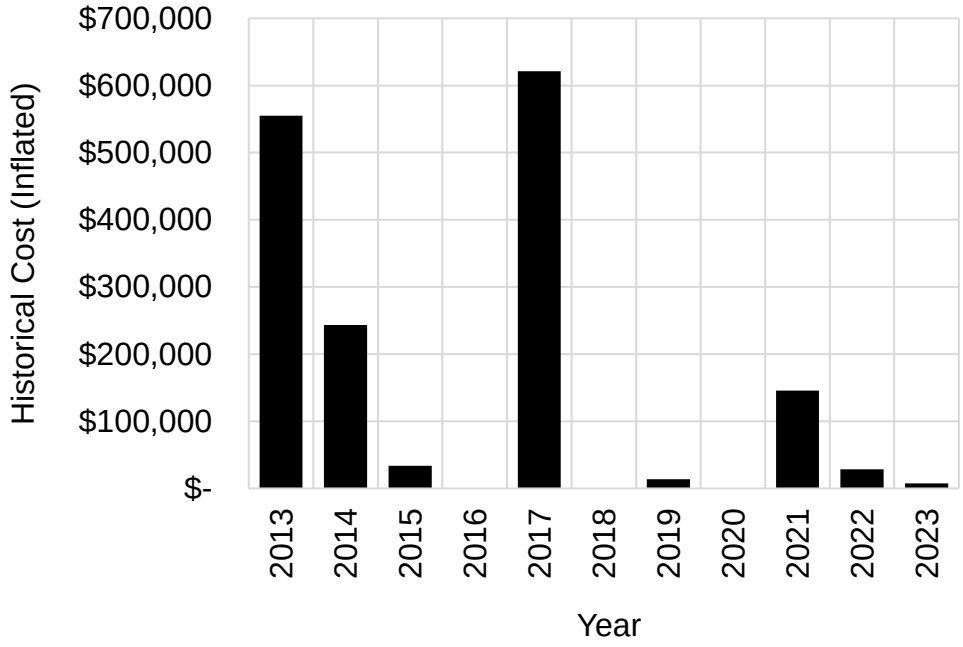
6.4 Lifecycle Strategy

To achieve the desired level of service, the Town prepares a lifecycle management plan for the category which serves as guidance and a source of reference for the level of investment across all phases of a facility asset's lifecycle.

6.4.1 Recent Investment

Figure 6-9 displays recent investment in the category over the previous 10 years. The figure concerns only the acquisition of new assets and the replacement of existing assets. To standardize the data, the historical cost of each asset has been inflated by 2% per year to the year 2024.

Figure 6-9: Recent Investment Overview



Examining recent investment in the facilities category indicates multiple peaks in expenditures. In 2013, the majority of investment was toward a workshop for the Operations service area. The workshop is equipped with administrative offices, three vehicle bays, and staff facilities supporting multiple departments providing a range of services. In 2017, the Natasha Paterson Memorial Pavilion and the Fiddle Park Pavilion were added to the category along with multiple window replacements at Town Hall.

6.4.2 Acquisition

Data for facilities acquisitions was sourced from documents such as the 2024 Annual Budget and the 2023 Park and Recreation Master Plan.

Figure 6-10 highlights upcoming acquisitions. Due to the low quantity, the figure includes all items forecasted.

Figure 6-10: Projected Upcoming Acquisitions

Year	Service Area	Description	Projected Cost
2025	Operations	Cold storage building	$400,000
2025	Operations	Operations Centre expansion	$1,200,000
2028	Parks and Recreation	Public Washroom, Greenwood Park	$600,000

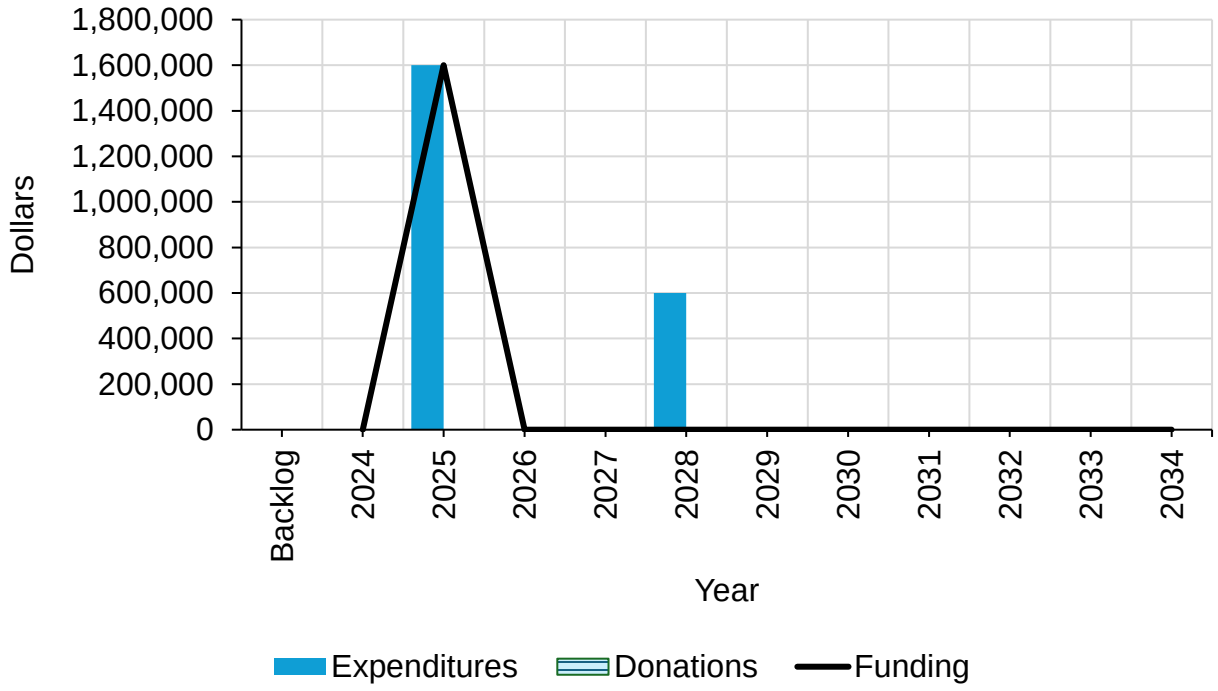
Figure 6-11 details acquisition costs expected over the 10-year planning period.

Figure 6-11: Projected Acquisition Expenditures

Planning Period	Year	Projected Expenditures	Projected Donations	Projected Funding	Balance
Backlog	Backlog	$0	$0		$0
Year 0	2024	$0	$0	$0	$0
Year 1	2025	$1,600,000	$0	$1,600,000	$0
Year 2	2026	$0	$0	$0	$0
Year 3	2027	$0	$0	$0	$0
Year 4	2028	$600,000	$0	$0	-$600,000
Year 5	2029	$0	$0	$0	$0
Year 6	2030	$0	$0	$0	$0
Year 7	2031	$0	$0	$0	$0
Year 8	2032	$0	$0	$0	$0
Year 9	2033	$0	$0	$0	$0
Year 10	2034	$0	$0	$0	$0
Total		**$2,200,000**	**$0**	**$1,600,000**	**-$600,000**

Figure 6-12 summarizes acquisition activities.

Figure 6-12: Acquisition Overview



Over the 10-year planning period, 74% of facility acquisitions are funded with an overall gap of $600,000. Funded assets include an expansion to the Operations Centre and additional cold storage building for the Operations service area. To support these projects, a total of $378,00 will stem from development charges while the remaining balance of $1,222,000 is allocated from reserves.

The funding gap in 2028 is due to the planned acquisition of a public washroom in Greenwood Park, which was identified in the 2023 Parks and Recreation Master Plan. Municipal staff have not presented allocated funding for this project which is scheduled for review during the preparation of the 2025 Annual Budget.

As will be outlined on the following pages, it is critical to keep in sight the additional expenses for operation and maintenance costs stemming from the construction of these new facilities.

6.4.3 Operation and Maintenance

The cost of operation and maintenance activities for the facilities category was assembled through a review of financial data found in the 2024 Annual Budget and other planned projects.

Figure 6-13 showcases operation costs for facilities.

Figure 6-13: Projected Operation Expenditures

Planning Period	Year	Primary Expenditures	Secondary Expenditures	Total Projected Expenditures	Projected Funding	Balance
Year 0	2024	$429,515	$0	$429,515	$429,515	$0
Year 1	2025	$438,105	$125,000	$563,105	$563,105	$0
Year 2	2026	$472,454	$0	$472,454	$472,454	$0
Year 3	2027	$481,903	$0	$481,903	$481,903	$0
Year 4	2028	$491,541	$0	$491,541	$491,541	$0
Year 5	2029	$501,372	$0	$501,372	$501,372	$0
Year 6	2030	$511,399	$0	$511,399	$511,399	$0
Year 7	2031	$521,627	$0	$521,627	$521,627	$0
Year 8	2032	$532,060	$0	$532,060	$532,060	$0
Year 9	2033	$542,701	$0	$542,701	$542,701	$0
Year 10	2034	$553,555	$0	$553,555	$553,555	$0
Total		**$5,476,230**	**$125,000**	**$5,601,230**	**$5,601,230**	**$0**

Figure 6-14 highlights expenses related to maintenance over the 10-year period.

Figure 6-14: Projected Maintenance Expenditures

Planning Period	Year	Primary Expenditures	Secondary Expenditures	Total Projected Expenditures	Projected Funding	Balance
Year 0	2024	$132,000	$12,000	$144,000	$144,000	$0
Year 1	2025	$134,640	$35,000	$169,640	$169,640	$0
Year 2	2026	$137,333	$0	$137,333	$137,333	$0
Year 3	2027	$140,079	$0	$140,079	$140,079	$0
Year 4	2028	$142,881	$0	$142,881	$142,881	$0
Year 5	2029	$145,739	$0	$145,739	$145,739	$0
Year 6	2030	$148,653	$0	$148,653	$148,653	$0
Year 7	2031	$151,627	$0	$151,627	$151,627	$0
Year 8	2032	$154,659	$0	$154,659	$154,659	$0
Year 9	2033	$157,752	$0	$157,752	$157,752	$0
Year 10	2034	$160,907	$0	$160,907	$160,907	$0
Total		**$1,606,270**	**$47,000**	**$1,653,270**	**$1,653,270**	**$0**

On the following page, the operation and maintenance overview are found in Figure 6-15 and 6-16.

Figure 6-15: Operation Overview

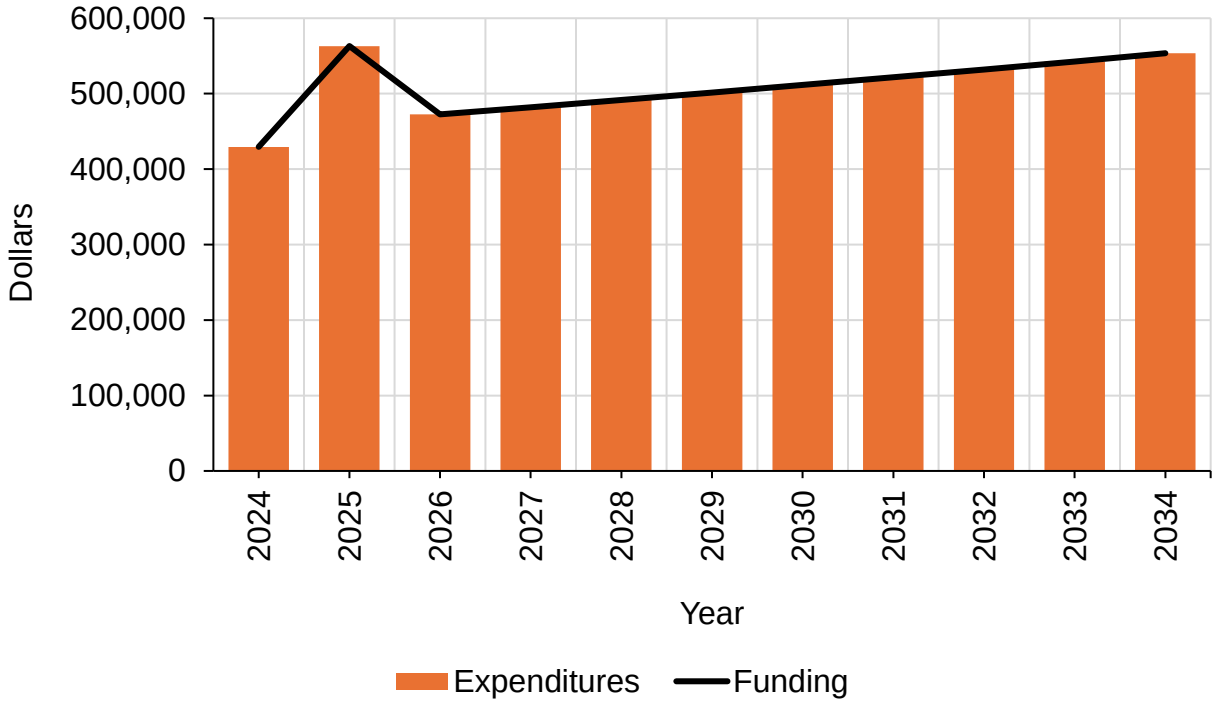
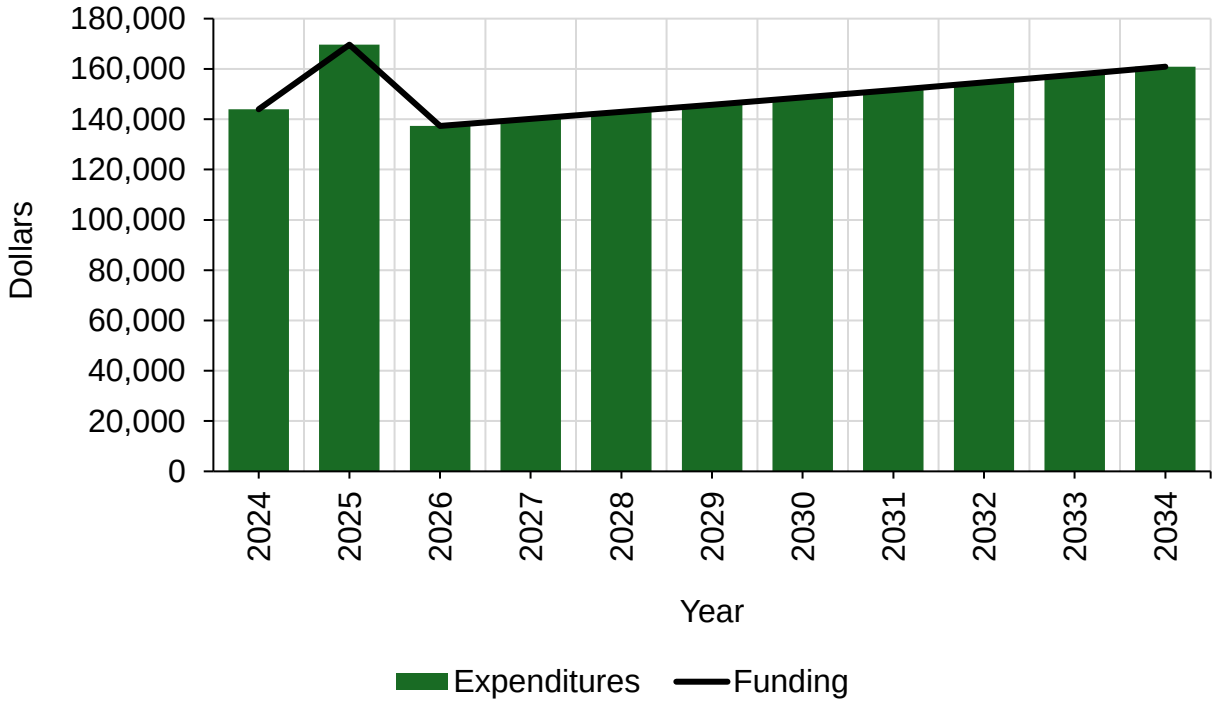


Figure 6-16: Maintenance Overview



Below, Figure 6-17 and 6-18 provide examples of the operation and maintenance activities for facilities.

Figure 6-17: Operation Activities

Activity	Interval	Description	Purpose
Electrical Safety Authority (ESA) Inspection	Quarterly	Inspection of all electrical components including panels, receptacles, and any upgraded electrical work.	In accordance with building code regulations.
Elevator Inspection	Monthly	Inspection of elevator components.	In accordance with building code.
Fire Inspection	Various	Inspection and testing of full fire system including panels, extinguishers, alarms, strobe lights, and communications.	In accordance with building and fire code regulations.
Fire Suppression System Inspection	Weekly	Fire suppression system inspected for pressure and other operating parameters.	Ensured performance of fire suppression system.
Health Inspection	Annually	Full kitchen and related facility inspection.	In accordance with local health unit code.
Overhead Door Inspection	Annually	Inspection of overhead door components.	Prevention of wear and tear. Prolonged life of components.
Radiant Heater Inspection	Annually	Radiant heaters are cleaned and inspected.	Maintained performance and prolonged life of heater components.
Sand Storage Structure Inspection	Annually	Inspection of structure components.	Prevention of wear and tear. Prolonged life of structure.
Technical Standards Safety Authority (TSSA) Inspection	Annually	Inspection of elevator components.	In accordance with building code and TSSA regulations.

Figure 6-18: Maintenance Activities

Activity	Interval	Description	Purpose
Floor Buffing	Annually	Buffing of tile floors.	Maintained facility aesthetics and prevention of wear and tear.
Floor Drain Debris Removal	Semi-Annually	Removal of debris from floor drainage system components.	Maintained performance of floor drainage system.
Grounds Maintenance	As Needed	Debris collection and garden maintenance.	Maintained facility aesthetics.
HVAC Filter Replacement	Semi-Annually	Replacement of filters for all HVAC units.	Prevention of wear and tear and prolonged life of components.
Interior Painting	Annually	Select interior spaces are repainted.	Maintained facility aesthetics and prevention of wear and tear.
Parking Lot Re-Grading	Bi-Annually	Parking lot is re-graded to maintain drainage, mitigate potholes, and other general surface maintenance.	Prevention of wear and tear.
Roof Drain Debris Removal	Annually	Debris is removed around roof drains.	Maintained performance of roof drainage system.
Window Cleaning	Annually	Window exterior glass is cleaned.	Maintained facility aesthetics.
Winter Control	As Needed	Removal of snow and ice mitigation on sidewalks, entrances, and other exterior surfaces.	Maintained safety of exterior surfaces during winter months.

Both the operation and maintenance forecasts are indicated to be fully funded over the 10-year planning period. However, it is key to recognize that the acquisitions outlined in Figure 6-10 will increase operation and maintenance costs. The type of operating and maintenance costs that may require a higher level of funding are:

- Maintenance materials
- Staff labour for facility maintenance
- Utilities (hydro, gas, water)

Reviewing the secondary expenditures column of figures 6-13 and 6-14, the operation forecast indicates an additional expense of $125,000 in 2025. This is the result of a facility condition assessment as identified in the 2024 Parks and Recreation Master Plan. For maintenance, the additional expenses are attributed to LED lighting upgrade projects at the Operations Yard and Town Hall, which are predicted to reduce annual operation costs related to electricity consumption.

6.4.4 Replacement

To construct a replacement plan for facilities, staff assessed the needs of each facility in detail. The majority of replacement costs are found in the 2024 Annual Budget. Figure 6-19 showcases projected upcoming replacements for the category in the next 3 years.

Figure 6-19: Projected Upcoming Replacements

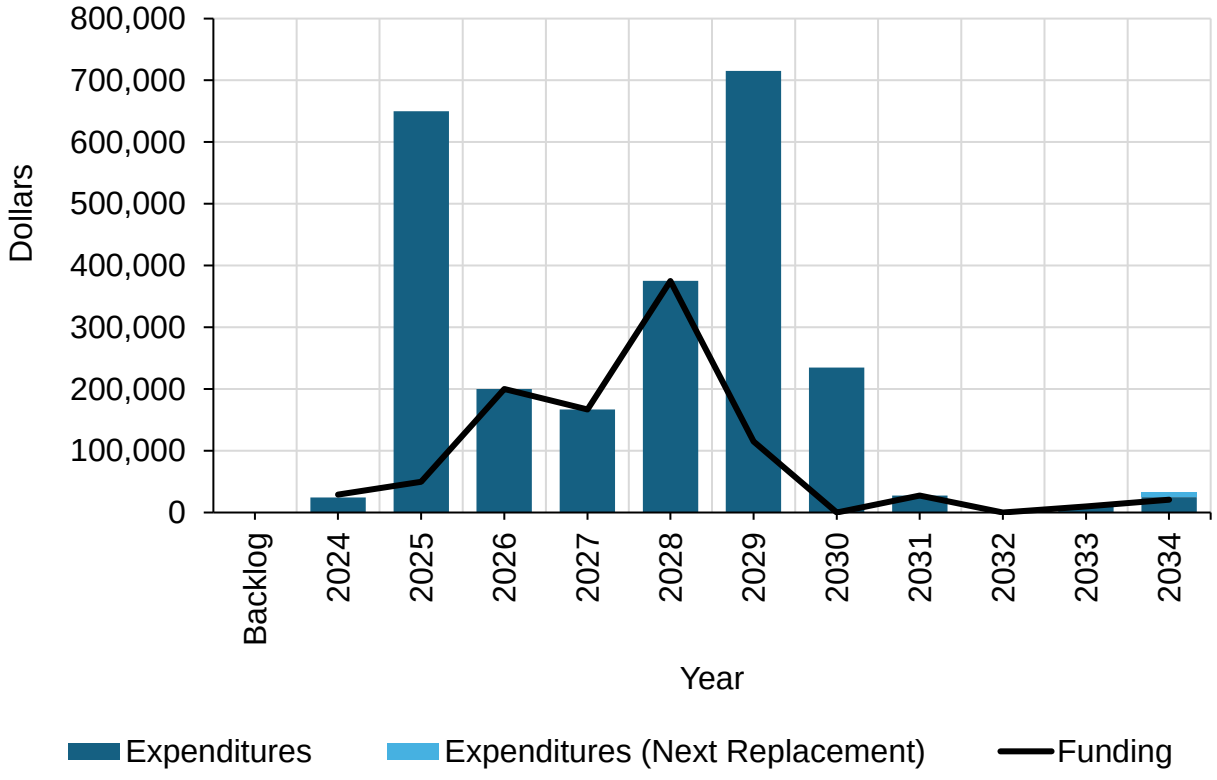
Year	Facility	Asset ID	Description	Projected Cost
2024	Town Hall	Pending	Windows (6)	$17,750
2025	KTH Park	14636	Public Washroom	$600,000
2025	Town Hall	22220	Make Up Air Unit	$50,000
2026	Town Hall	Pending	Front Entrance	$200,000
2027	Town Hall	12736	Dry Pipe Sprinkler System	$150,000
2027	Town Hall	Pending	Flag Pole (3)	$17,000

Projected replacement expenditures and the replacement overview are found on the following page as Figure 6-20 and 6-21.

Figure 6-20: Projected Replacement Expenditures

Planning Period	Year	Projected Expenditures	Projected Funding	Balance
Backlog	Backlog	$0		$0
Year 0	2024	$24,250	$29,000	$4,750
Year 1	2025	$650,000	$50,000	-$600,000
Year 2	2026	$200,000	$200,000	$0
Year 3	2027	$167,000	$167,000	$0
Year 4	2028	$375,000	$375,000	$0
Year 5	2029	$715,000	$115,000	-$600,000
Year 6	2030	$234,840	$0	-$234,840
Year 7	2031	$27,520	$27,520	$0
Year 8	2032	$0	$0	$0
Year 9	2033	$10,000	$10,000	$0
Year 10	2034	$32,572	$20,509	-$12,063
Total		**$2,436,182**	**$994,029**	**-$1,442,153**

Figure 6-21: Replacement Overview



The two largest funding gaps are found in 2025 and 2029 of the replacement overview and are the anticipated replacement of the Greenwood Park and KTH Park public washrooms. These two facilities will require an estimated investment of $1,200,000. The funding gap will be further reviewed by municipal staff during 2025 Annual Budget preparations.

Contributing to expenses in 2030, are unconfirmed upgrades to Grace Tipling Hall. These upgrades are indicated as “unconfirmed” due to being dependent on grant funding and therefore are subject to grant availability and acceptance. Due to the grant, the timing and cost for these upgrades are likely to vary.

The only asset requiring replacement more than once in the planning period is the Town Hall car port door, which was purchased in 2024 and is expected to have a service life of 10 years, landing its next replacement in 2034.

6.4.5 Lifecycle Overview

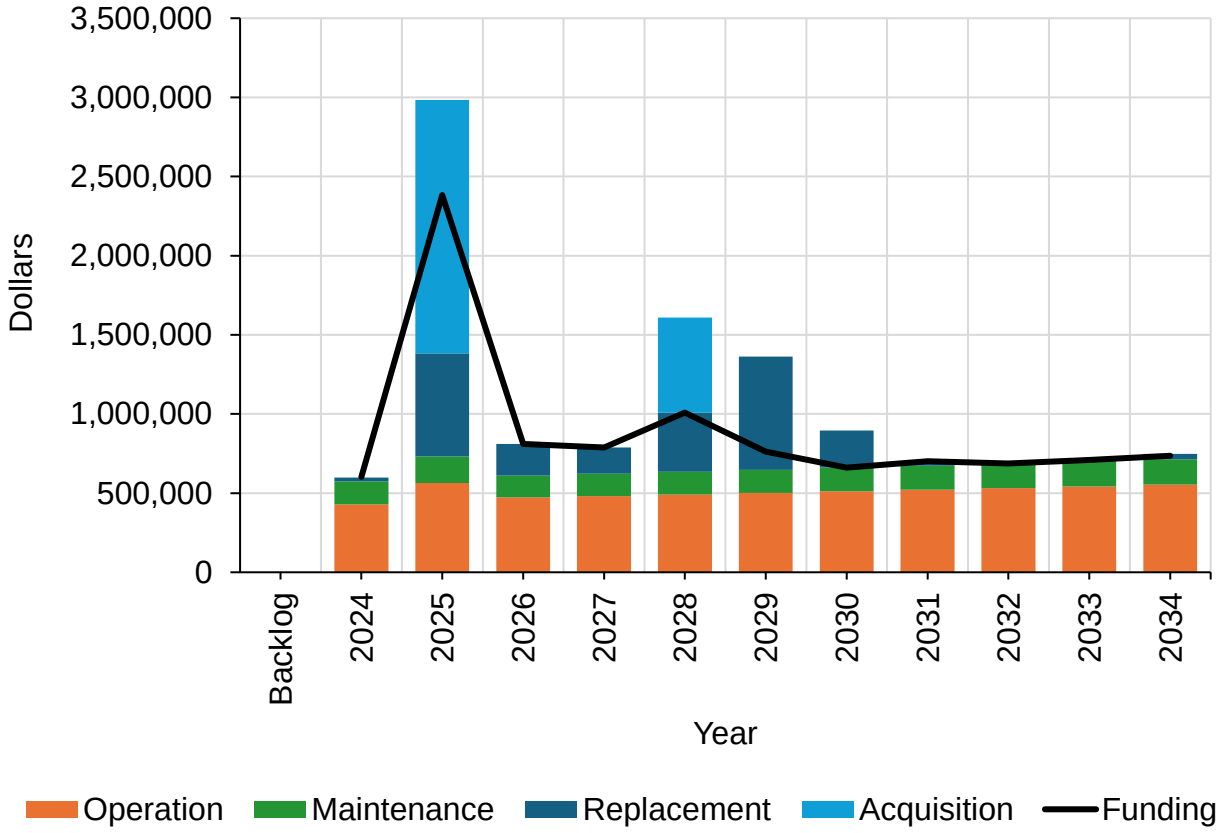
Outlining the full lifecycle forecast and planned budget for the facilities category, the fleet lifecycle forecast is found in Figure 6-22 on the following page.

Figure 6-22: Projected Lifecycle Expenditures

Planning Period	Year	Acquisition	Operation	Maintenance	Replacement	Total Expenditures	Total Funding	Balance
Backlog	Backlog	$0			$0	$0		
Year 0	2024	$0	$429,515	$144,000	$24,250	$597,765	$602,515	$4,750
Year 1	2025	$1,600,000	$563,105	$169,640	$650,000	$2,982,745	$2,382,745	-$600,000
Year 2	2026	$0	$472,454	$137,333	$200,000	$809,786	$809,786	$0
Year 3	2027	$0	$481,903	$140,079	$167,000	$788,982	$788,982	$0
Year 4	2028	$600,000	$491,541	$142,881	$375,000	$1,609,422	$1,009,422	-$600,000
Year 5	2029	$0	$501,372	$145,739	$715,000	$1,362,110	$762,110	-$600,000
Year 6	2030	$0	$511,399	$148,653	$234,840	$894,892	$660,052	-$234,840
Year 7	2031	$0	$521,627	$151,627	$27,520	$700,774	$700,774	$0
Year 8	2032	$0	$532,060	$154,659	$0	$686,719	$686,719	$0
Year 9	2033	$0	$542,701	$157,752	$10,000	$710,453	$710,453	$0
Year 10	2034	$0	$553,555	$160,907	$32,572	$747,034	$734,971	-$12,063
Total		**$2,200,000**	**$5,601,230**	**$1,653,270**	**$2,436,182**	**$11,890,683**	**$9,848,530**	**-$2,042,153**

The lifecycle overview is found on the following page as Figure 6-23.

Figure 6-23: Lifecycle Overview



The 10-year facilities lifecycle estimate indicates an insufficient level of investment totaling $2,042,153 due to projected acquisitions and replacements. While many acquisition and replacement costs are fully funded, it is the unfunded acquisition and replacement peaks in 2025, 2028, and 2029 that contribute the most to the gap in funding. As discussions continue for updating the Long-Term Financial Plan and 2025 Annual Budget, opportunities to address funding shortfalls will be reviewed.

Lifecycle activities can be delayed, but they must be delayed strategically, and it must be recognized as a short-term cost reduction strategy. New facilities are ultimately necessary to meet increases in demand, and components of buildings must eventually be replaced. Similarly, deferring or reducing the frequency of operation and maintenance activities can impact the service life of an asset. Overall, it should be understood that changes to the lifecycle activities affect the level of service and by extension the customer experience.

6.5 Risk Management

Structures that fall within the facilities category are an anchor for all municipal services. Each service area requires administrative office space, equipment to repair vehicles and machinery, and a platform for providing in-person service to residents. It is therefore critical to ensure risk has been clearly defined for these assets when making decisions regarding the level of investment for the category.

6.5.1 Critical Assets

Critical assets carry the highest impact to services and consequences in the event of failure. An example of critical facility assets is outlined in Figure 6-24.

Figure 6-24: Critical Assets

Service Area	Critical Asset
Administration	Town Hall
Operations	Operations Centre

6.5.2 Risk Assessment

As discussed in section 6.4, there are instances of funding shortfalls throughout the lifecycle of multiple facility assets. When considering the deferral of a lifecycle activity as a cost savings measure, it is vital to balance the decision against the potential risk.

Below, Figure 6-25 highlights the relationship between deferring lifecycle activities and risk.

Figure 6-25: Lifecycle Activities and Potential Risk

Deferred Activity	Potential Risk
Acquisition	▪ Increased likelihood of deficiencies due to overuse ▪ Increased likelihood of safety issues due to overuse
Operation and Maintenance	▪ Increased likelihood of unresolved deficiencies ▪ Increased likelihood of safety issues ▪ Increased likelihood of reduced aesthetics ▪ Increased likelihood of reduced cleanliness
Replacement	▪ Increased likelihood of downtime due to age ▪ Increased likelihood of decreased performance due to age ▪ Increased likelihood of higher maintenance costs due to age

6.5.3 Potential Service Impact

In the event of critical asset failure, services provided by the facilities asset category would be impacted. Figure 6-26 highlights potential service impacts due to failure.

Figure 6-26: Potential Service Impacts

Service Area	Critical Asset	Potential Service Impact
Administration	Town Hall	▪ Unable to provide in-person support to customers. ▪ Unable to process customer payments in person. ▪ Unable to access specialized equipment, such as folding machines. ▪ Unable to access physical files, such as by-laws, property records, and infrastructure drawings.
Operations	Operations Centre	▪ Unable to access workshop to maintain and repair vehicles, machinery, and equipment. ▪ Unable to refuel on premises, including access to specialized fuels. ▪ Unable to store vehicles, machinery, and equipment in a sheltered and climate-controlled environment. ▪ Unable to access physical files, such as infrastructure drawings and operation records.

6.5.4 Potential Consequences

In addition to impacts to service, the failure of a critical facility asset would carry with it consequences for the organization. Figure 6-27 suggests potential consequences in the event of failure based on the service impacts in Figure 6-26.

Figure 6-27: Potential Consequences

Consequence Type	Likelihood
Environmental	Unlikely
Financial	Likely
Health/Safety	Unlikely
Legal/Compliance	Likely
Operational	Likely
Reputational	Likely
Service Delivery	Likely

Weighing the potential consequences from critical asset failure, and considering the likely duration of each, is vital when discussing risk.

6.5.5 Climate Change

Factors due to climate change have the potential to impact how facilities are operated and can introduce risk. Figure 6-28 outlines some potential factors of climate change, the impact they could have on facilities, and the potential risk as it relates to lifecycle management.

Figure 6-28: Climate Change Risks

Factor	Potential Impact	Potential Lifecycle Risk
Frequency of Severe Weather	▪ Increased rate of deterioration for exterior structure elements. ▪ Increased frequency of damage to exterior structure elements.	▪ Higher renewal costs due to shorter service life. ▪ Higher maintenance costs due to more frequent repairs.
Higher Average Temperatures	▪ Increased operation of HVAC systems for interior climate control. ▪ Increased rate of deterioration for exterior structure elements.	▪ Higher renewal costs due to shorter service life. ▪ Higher renewal costs due to requiring “heavier duty” parts. ▪ Higher maintenance costs due to more frequent repairs.

Considering the risks associated with climate change is vital to long-term planning for facility assets. Each of the potential lifecycle risks discussed in the figure above carry with them an increase in the required level of funding for the category.

6.6 Recommendations

The facilities category has room for improvement in the data found in the asset inventory.

First, focus on splitting facility assets in the inventory which are currently recorded as a single asset. Having elements of the building represented as individual assets allows for more effective modeling of service life, condition, and lifecycle activities.

Second, develop a strategy to incorporate detailed condition assessments into the asset inventory. Section 6.2.2 highlighted that all facility assets leverage an age-based condition rating. While staff are aware of the assessed condition of each structure, the Town's asset management program would benefit from adding this data to the asset inventory.

Section 7 – Fleet

7.1 Quantity and Replacement Cost

The quantity of assets by service area with replacement cost is displayed in Figure 7-1.

Figure 7-1: Quantity and Replacement Cost (2024)

Service Area	Vehicle Type	Quantity	Replacement Cost
Administration	SUVs	1	$32,782
Parks & Recreation	Pickup Trucks	1	$73,844
By-Law Enforcement	SUVs	1	$31,000
Operations	SUVs	1	$55,697
	Pickup Trucks	8	$634,515
	Plow Trucks	3	$1,004,863
Utilities	Pickup Trucks	3	$240,908
Total		**18**	**$2,073,609**

Replacement cost has been calculated using a mixture of inflated historical cost (33% of assets) and staff estimates (67% of assets). Staff estimates were based on existing invoices or quotes for an identical or comparable item. Both methods are as of 2024.

Further breakdown of asset quantities by service area and vehicle type is included in Figure 7-2 and 7-3.

Figure 7-2: Quantity by Service Area with Replacement Cost (2024)

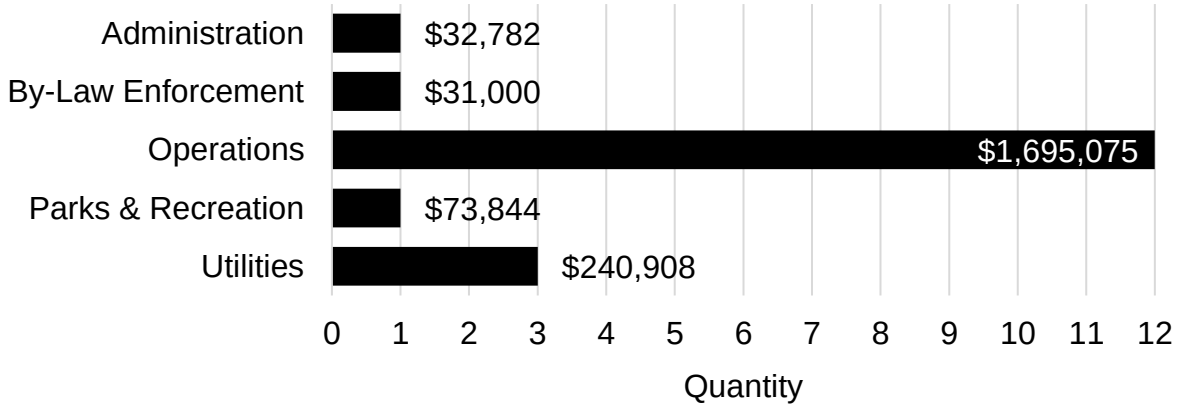
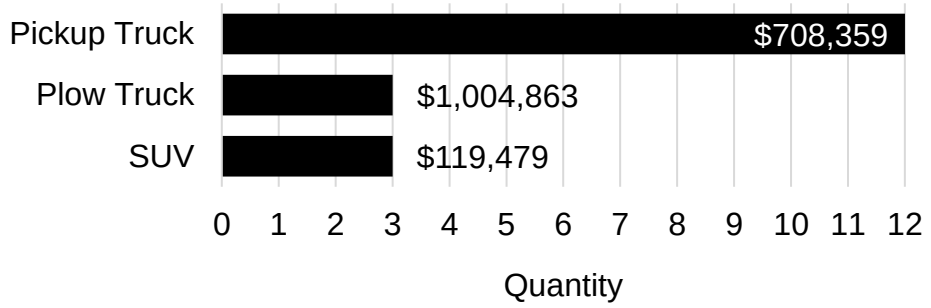


Figure 7-3: Quantity by Vehicle Type with Replacement Cost (2024)



7.2 Age and Condition

7.2.1 Age

The useful life and average age of assets in the category is outlined in Figure 7-4.

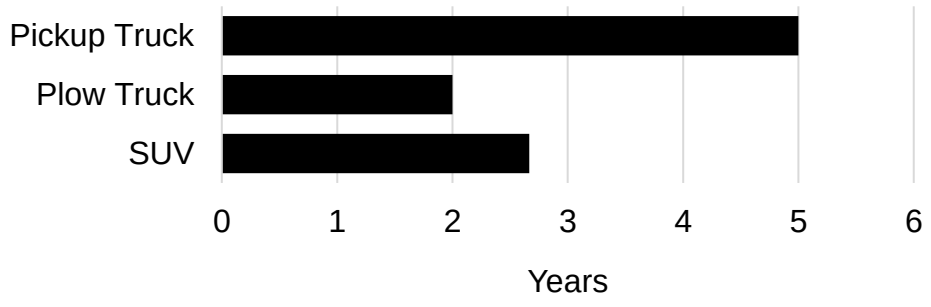
Figure 7-4: Useful Life and Average Age (2024)

Vehicle Type	Useful Life	Average Age
SUVs	7 Years	2 Years
Plow Trucks	10 Years	10 Years
Pickup Trucks	7 Years	4 Years

Beginning in 2025, the pickup truck vehicle type will be further broken down into light, medium, and heavy-duty pickup trucks. This will enable the Town to leverage a useful life that better models the service life of each truck and provide greater clarity when forecasting renewals.

Figure 7-5 highlights the average remaining useful life of assets in the category. The average remaining useful life is calculated by comparing the year assets reach the end of their useful life to the year 2024.

Figure 7-5: Average Remaining Useful Life (2024)



7.2.2 Condition

Expanding on the average remaining useful life, the approach to condition is discussed below. The fleet category relies upon the age of each asset to approximate the condition. Figure 7-6 showcases the condition scale for the Fleet category, while Figure 7-7 outlines the average age-based condition rating.

Figure 7-6: Condition Rating Scale

Condition	Rating
Very Good	80.00 and above
Good	60.00 and above
Fair	40.00 and above
Poor	20.00 and above
Very Poor	0.00 and above

Figure 7-7: Average Age-Based Condition Rating (2024)

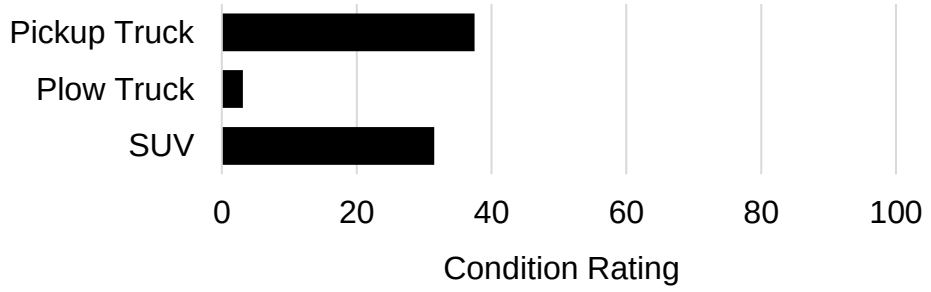


Figure 7-7 indicates a condition rating between poor and fair for pickup trucks and SUVs. Although the Town has recently accumulated new pickup truck and SUV assets, there are still multiple records in the asset inventory that are well beyond their useful life. This results in a condition rating near 0, which reduces the calculated average age-based condition rating.

Age-based ratings are intended to provide a high-level estimate of the condition of an asset. This results in many assumptions such as straight-line depreciation, which does not account for maintenance or premature failure of the asset. For example, a vehicle may show to have an age-based condition rating of 20 or less, but the replacement of components has the potential to improve the overall condition of the vehicle substantially.

7.3 Level of Service

Fleet assets are key to maintaining a wide variety of municipal services, such as transportation, parks, water, and wastewater. The organization depends heavily on the performance of fleet assets to ensure the level of service can be maintained.

7.3.1 Level of Service Objectives

Level of service objectives establish the baseline for discussing level of service. Objectives are qualitative statements that reflect customer and organizational values. Service parameters are utilized to categories each objective.

Figure 7-8 highlights applicable level of service objectives for fleet.

Figure 7-8: Level of Service Objectives

Service Parameter	Objective Statement
Availability	Fleet assets can support multiple field operations simultaneously.
Capacity	Fleet assets are suitably equipped to meet the needs of the organization.
Quality	Fleet assets are maintained to a high degree of performance.
Reliability	Fleet assets are maintained in a manner which minimizes downtime.
Responsiveness	Municipal staff are available for questions and assistance.
Safety	Fleet assets are operated in a manner which ensures safety.

On the following page, level of service discussions continues with performance measures.

7.3.2 Performance Measures

The use of performance measures allows the qualitative level of service objectives to be translated into quantifiable indicators of performance. Service parameters are used as a framework to guide the development of relevant performance measures.

Applicable performance measures for fleet are found in Figure 7-9.

Figure 7-9: Performance Measures

Service Parameter	Performance Measure
Availability	Ratio of number of vehicles to number of staff in each service area.
Capacity	Number of vehicles requiring additional equipment outfitting.
Quality	Percent of preventative maintenance completed on time.
Reliability	Number of days a fleet asset is unavailable due to downtime.
Responsiveness	Municipal staff response time to customer inquiries.
Safety	Percent of fleet meeting commercial safety certification standards.

Refinement and data collection for performance measures is currently underway to ensure suitability for the July 1, 2025 requirements of Ontario Regulation 588/17. As a result, the current and target performance of each measure has been excluded for fleet from the 2024 Asset Management Plan.

Please refer to section 7.3.1 and 7.3.2 for the Town's approach to measuring the performance of fleet assets.

7.4 Lifecycle Strategy

The lifecycle management plan outlines the Town's approach to managing assets in the fleet category. The plan details the level of investment required for each lifecycle activity to continue operating the assets at the level of service discussed in section 7.3.

7.4.1 Recent Investment

To better understand the current fleet inventory, Figure 7-10 showcases the recent investment in the category over the last 10 years for acquisitions and renewals. Due to many previously disposed assets missing a replacement cost which follows the current approach to costing for the category, the historical cost has been referenced. To standardize financial data, the historical cost of each asset was inflated by 2% per year to the year 2024.

Figure 7-10: Recent Investment Overview

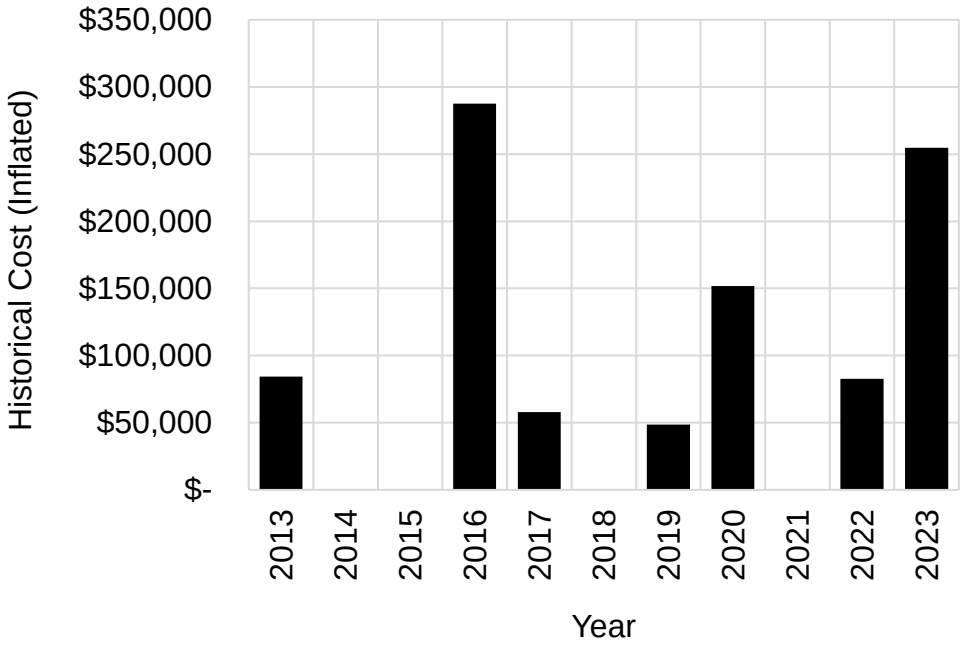


Figure 7-10 communicates the importance of regular investment in the fleet category. Peaks of renewal needs typically stem from multiple assets with an identical useful life being purchased in the same year, and therefore requiring renewal at the same time.

For example, the two peaks in the visual are 7 years apart, which is likely due to the useful life of 7 years being applied to many vehicle types in the fleet category. To address peaks of investment, it is vital that asset condition and forecasted renewal needs continue to be closely monitored.

7.4.2 Acquisition

For fleet assets, the planning for acquisitions was completed by first assessing whether the existing inventory is meeting expectations. Next, reports, plans, and studies concerning the development of services related to fleet, such as the construction of new roads, and parks, were reviewed to ensure the level of service can be sustained. Finally, the planned budget is added for each year.

Figure 7-11 highlights upcoming acquisitions. Due to the low quantity of forecasted acquisitions, the figure includes all items forecasted.

Figure 7-11: Projected Upcoming Acquisitions

Year	Service Area	Description	Forecast
2024	Operations	Plow truck and related attachments	$343,272
2027	Operations	Medium-duty pickup truck	$85,000
2030	Operations	Plow truck and related attachments	$400,000

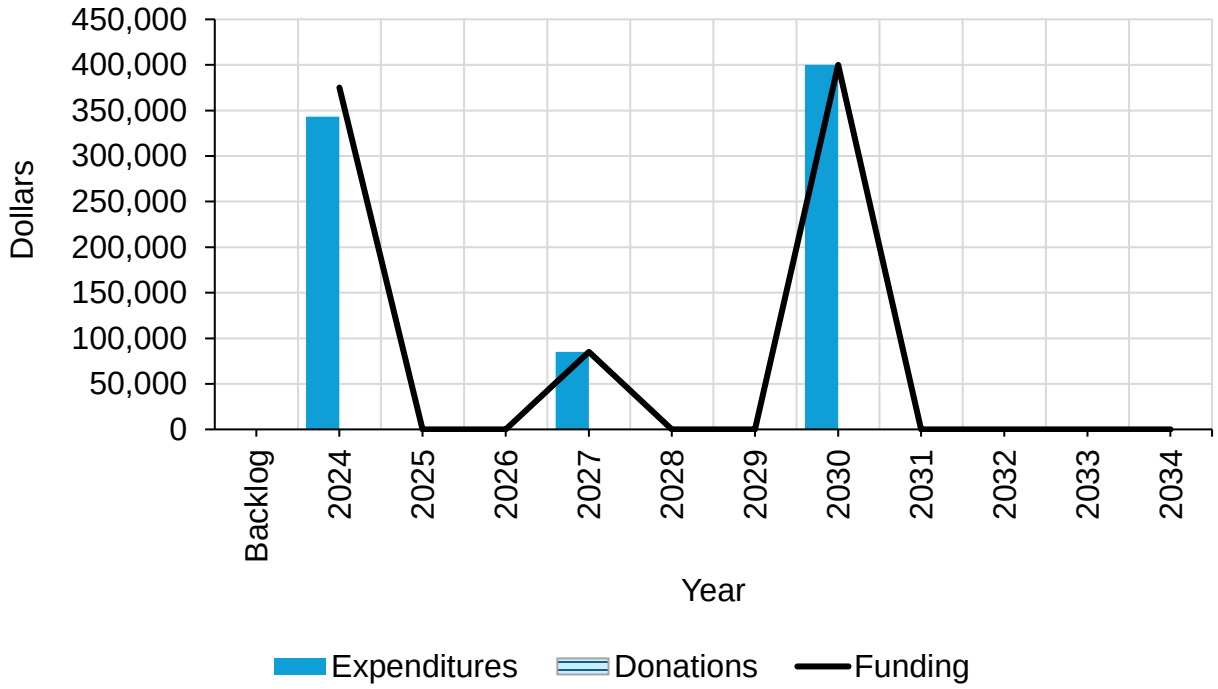
Figure 7-12 showcases forecasted acquisition costs over the 10-year planning period.

Figure 7-12: Projected Acquisition Expenditures

Planning Period	Year	Projected Expenditures	Projected Donations	Projected Funding	Balance
Backlog	Backlog	$0	$0		$0
Year 0	2024	$343,272	$0	$375,000	$31,728
Year 1	2025	$0	$0	$0	$0
Year 2	2026	$0	$0	$0	$0
Year 3	2027	$85,000	$0	$85,000	$0
Year 4	2028	$0	$0	$0	$0
Year 5	2029	$0	$0	$0	$0
Year 6	2030	$400,000	$0	$400,000	$0
Year 7	2031	$0	$0	$0	$0
Year 8	2032	$0	$0	$0	$0
Year 9	2033	$0	$0	$0	$0
Year 10	2034	$0	$0	$0	$0
Total		**$828,272**	**$0**	**$860,000**	**$31,728**

Figure 7-13 summarizes the acquisition plan, visualizing expenditures and donations alongside the projected funding.

Figure 7-13: Acquisition Overview



For all 10 years of the planning period, fleet acquisitions are fully funded by development charges. The surplus of $31,728 in 2024 is due to the asset already being purchased at the time this document was written, meaning the projected amount can be adjusted to be more representative of the actual cost.

As discussed, a wide range of municipal services are supported by fleet. Therefore, the purchase of additional fleet assets, such as those as outlined in Figure 7-11 is predominately guided by growth. As more subdivisions and parkland is built, the quantity of roads to maintain during winter months and the number of park staff and equipment requiring reliable and daily transportation increases.

It is key to remember that with acquisitions comes additional operation, maintenance, and replacement costs. A higher quantity of vehicles will result in greater expenditures for items such as fuel, insurance, and annual maintenance. Additionally, these acquisitions will eventually ultimately require replacement. These costs are discussed further in Section 7.4.3 and 7.4.4.

7.4.3 Operation and Maintenance

Operation and maintenance expenditures were assembled by reviewing operating accounts found in the 2024 Annual Budget which supporting fleet across multiple service areas, such as roads and parks.

Figure 7-14 outlines the operation expenditures for each year of the planning period.

Figure 7-14: Projected Operation Expenditures

Planning Period	Year	Primary Expenditures	Secondary Expenditures	Total Projected Expenditures	Projected Funding	Balance
Year 0	2024	$197,293	$0	$197,293	$197,293	$0
Year 1	2025	$201,239	$0	$201,239	$201,239	$0
Year 2	2026	$205,264	$0	$205,264	$205,264	$0
Year 3	2027	$209,369	$0	$209,369	$209,369	$0
Year 4	2028	$213,556	$0	$213,556	$213,556	$0
Year 5	2029	$217,827	$0	$217,827	$217,827	$0
Year 6	2030	$222,184	$0	$222,184	$222,184	$0
Year 7	2031	$226,628	$0	$226,628	$226,628	$0
Year 8	2032	$231,160	$0	$231,160	$231,160	$0
Year 9	2033	$235,783	$0	$235,783	$235,783	$0
Year 10	2034	$240,499	$0	$240,499	$240,499	$0
Total		**$2,400,802**	**$0**	**$2,400,802**	**$2,400,802**	**$0**

Projected maintenance costs are shown in Figure 7-15.

Figure 7-15: Projected Maintenance Expenditures

Planning Period	Year	Primary Expenditures	Secondary Expenditures	Total Projected Expenditures	Projected Funding	Balance
Year 0	2024	$50,000	$0	$50,000	$50,000	$0
Year 1	2025	$51,000	$0	$51,000	$51,000	$0
Year 2	2026	$52,020	$0	$52,020	$52,020	$0
Year 3	2027	$53,060	$0	$53,060	$53,060	$0
Year 4	2028	$54,122	$0	$54,122	$54,122	$0
Year 5	2029	$55,204	$0	$55,204	$55,204	$0
Year 6	2030	$56,308	$0	$56,308	$56,308	$0
Year 7	2031	$57,434	$0	$57,434	$57,434	$0
Year 8	2032	$58,583	$0	$58,583	$58,583	$0
Year 9	2033	$59,755	$0	$59,755	$59,755	$0
Year 10	2034	$60,950	$0	$60,950	$60,950	$0
Total		**$608,436**	**$0**	**$608,436**	**$608,436**	**$0**

On the following page, the operation and maintenance overviews can be found in Figure 7-16 and 7-17, respectively.

Figure 7-16: Operation Overview

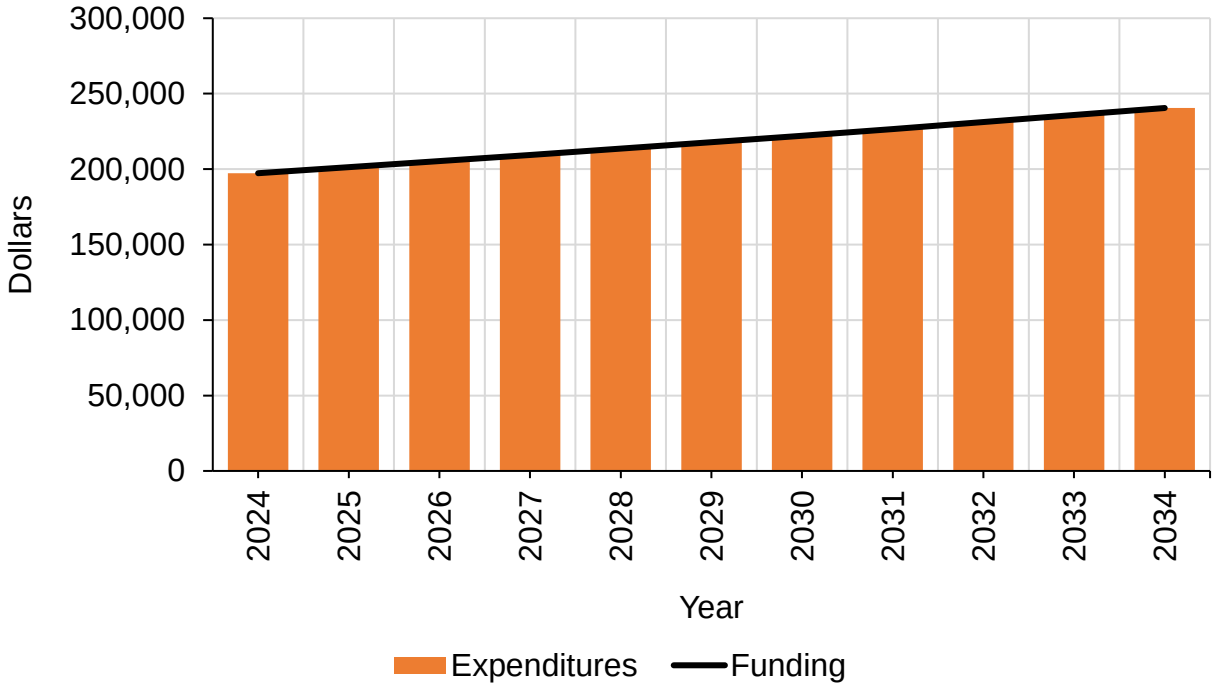
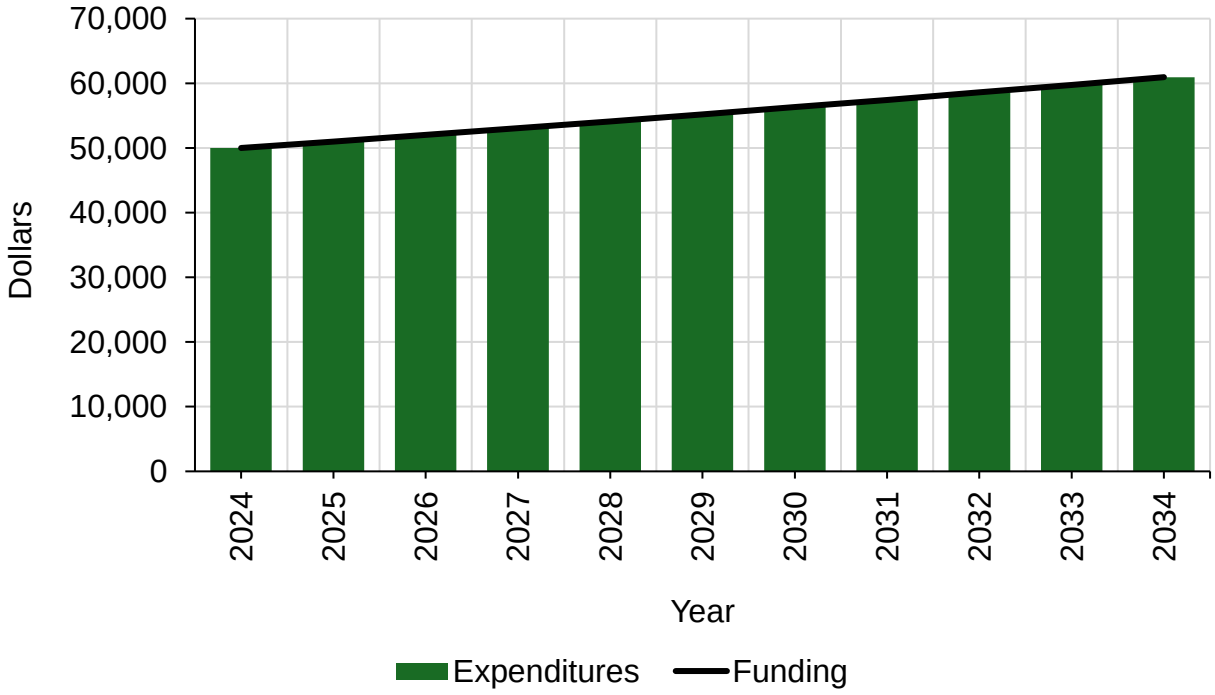


Figure 7-17: Maintenance Overview



Below, Figure 7-18 and 7-19 showcase operation and maintenance activities for fleet.

Figure 7-18: Operation Activities

Activity	Interval	Description	Purpose
Fuel	As Needed	A supply of petrol and diesel fuel is maintained for refuelling purposes.	Maintained vehicle operation.
Insurance	Annual	Insurance required for general vehicle operation.	Legislative compliance.
Licensing	Annual	Commercial vehicle operation registration is renewed.	Legislative compliance.
Vehicle Safety Certification	Annual	Vehicles are inspected as per commercial vehicle operation standards.	Legislative compliance.

Figure 7-19: Maintenance Activities

Activity	Interval	Description	Purpose
Heavy-Duty Vehicle Maintenance	Annual	Preventative maintenance for heavy-duty vehicles.	Prolonged life of asset.
Light-Duty Vehicle Maintenance	Annual	Preventative maintenance for light-duty vehicles.	Prolonged life of asset.
Plow Attachment Maintenance	Annual	Preventative maintenance for vehicle plow attachments.	Prolonged life of seasonal vehicle attachments.

Due to planned acquisitions, the costs associated with operation and maintenance activities for the fleet category are likely to increase in expenditures over the 10-year period. This increase is most likely to be visible in the following cost categories:

- Fuel and oil
- Insurance
- Maintenance supplies
- Radio and GPS subscription fees

The forecast of additional costs due to acquisitions is an assumption, but is important to recognize the financial relationship between these two lifecycle activities.

7.4.4 Replacement

To establish a replacement strategy for fleet, staff reviewed every asset in the category, and discussed topics such as vehicle age, condition, and performance. Maintaining a responsible renewal program is key for the Town to ensure the level of service can be sustained.

A subset of upcoming assets for replacement is included in Figure 7-20.

Figure 7-20: Projected Upcoming Replacements

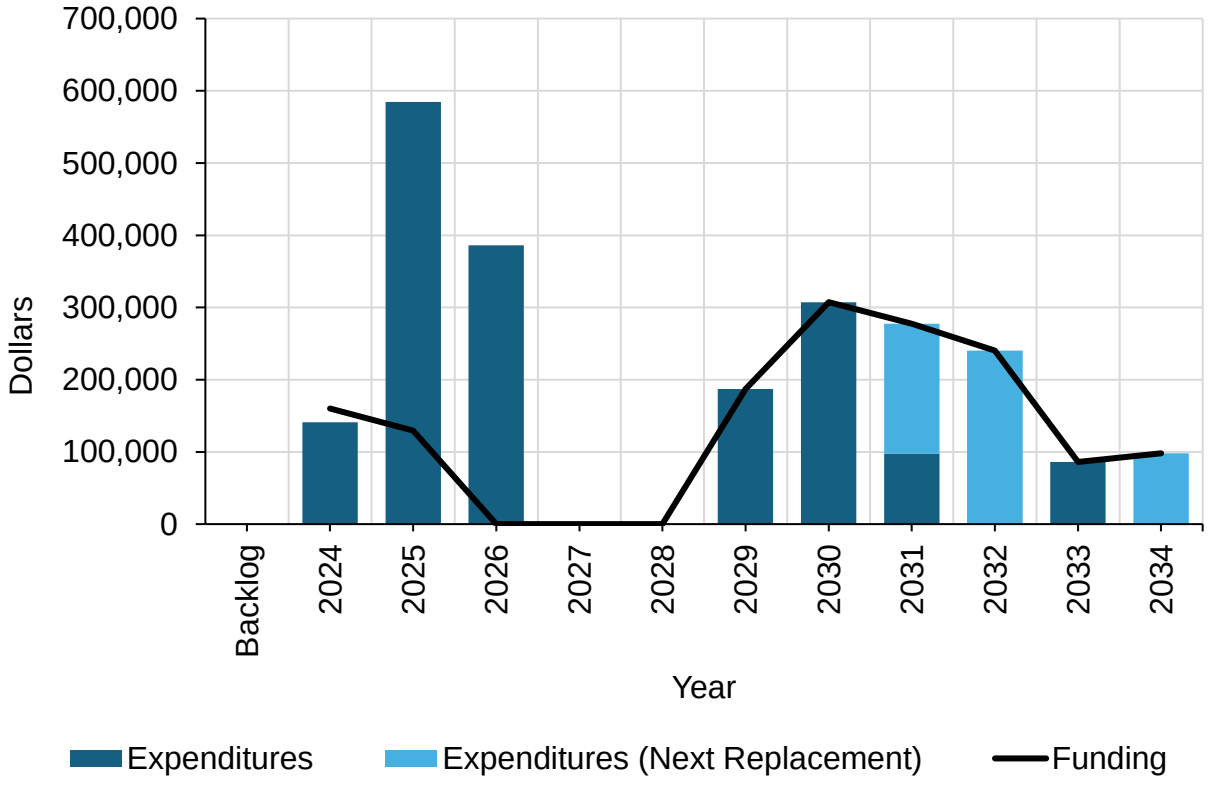
Year	Service Area	Asset ID	Description	Projected Cost
2024	Operations	19711	2012 Ford F-150	$70,512
2024	Operations	19988	2013 GMC Sierra	$70,512
2025	Operations	19989	2013 Ford F-150	$80,000
2025	Operations	14423	2011 International Plow Truck	$375,000
2025	Utilities	22125	2008 Ford E-350	$98,500
2025	By-Law Enforcement	21615	2019 Dodge Journey	$31,000

On the following page, Figure 7-21 and 7-22 highlight replacement expenditures and the replacement overview, respectively.

Figure 7-21: Projected Replacement Expenditures

Planning Period	Year	Projected Expenditures	Projected Funding	Balance
Backlog	Backlog	$0		$0
Year 0	2024	$141,024	$160,000	$18,977
Year 1	2025	$584,500	$129,500	-$455,000
Year 2	2026	$386,250	$0	-$386,250
Year 3	2027	$0	$0	$0
Year 4	2028	$0	$0	$0
Year 5	2029	$187,300	$187,300	$0
Year 6	2030	$307,301	$307,301	$0
Year 7	2031	$277,500	$277,500	$0
Year 8	2032	$240,330	$240,330	$0
Year 9	2033	$86,248	$86,248	$0
Year 10	2034	$98,262	$98,262	$0
Total		**$2,308,714**	**$1,486,441**	**-$822,273**

Figure 7-22: Replacement Overview



The replacement plan presents a deficit of $822,273 over the 10-year planning period. This is largely due to large expenditures scheduled for 2025 and 2026, such as the replacement of a plow vehicle. Forecasted costs from 2029 and 2034 are partly due to next replacements, meaning an asset replaced earlier in the planning period is already due for replacement again. This is the result of the fleet category utilizing a useful life of 7 years for some vehicles.

Any upcoming gaps in funding will be further investigated during the 2025 Annual Budget planning period. All replacement costs, including those which currently show a deficit, are expected to be funded by reserves.

7.4.5 Lifecycle Overview

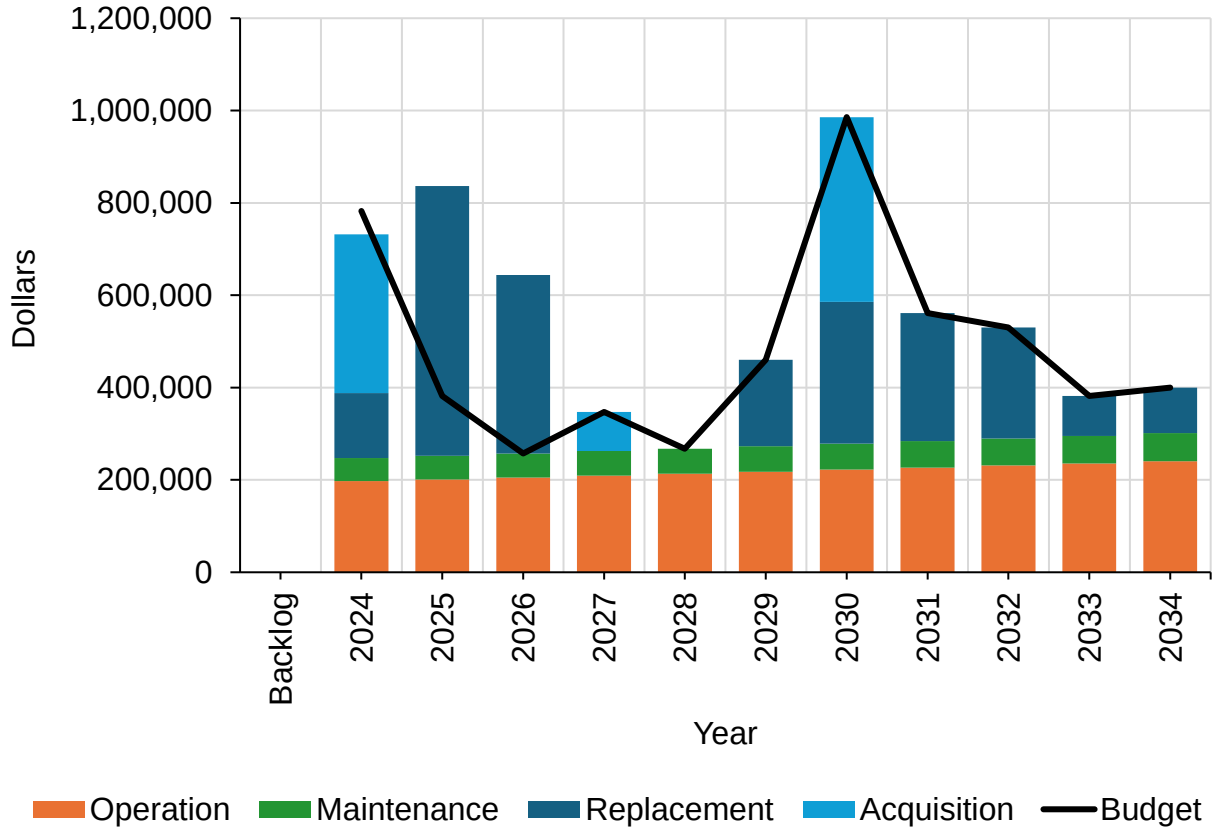
To understand the full lifecycle of assets in the fleet category, all lifecycle costs are brought together as Figure 7-23 on the following page.

Figure 7-23: Projected Lifecycle Expenditures

Planning Period	Year	Acquisition	Operation	Maintenance	Replacement	Total Expenditures	Total Funding	Balance
Backlog	Backlog	$0			$0	$0		$0
Year 0	2024	$343,272	$197,293	$50,000	$141,024	$731,589	$782,293	$50,705
Year 1	2025	$0	$201,239	$51,000	$584,500	$836,739	$381,739	-$455,000
Year 2	2026	$0	$205,264	$52,020	$386,250	$643,534	$257,284	-$386,250
Year 3	2027	$85,000	$209,369	$53,060	$0	$347,429	$347,429	$0
Year 4	2028	$0	$213,556	$54,122	$0	$267,678	$267,678	$0
Year 5	2029	$0	$217,827	$55,204	$187,300	$460,331	$460,331	$0
Year 6	2030	$400,000	$222,184	$56,308	$307,301	$985,793	$985,793	$0
Year 7	2031	$0	$226,628	$57,434	$277,500	$561,562	$561,562	$0
Year 8	2032	$0	$231,160	$58,583	$240,330	$530,073	$530,073	$0
Year 9	2033	$0	$235,783	$59,755	$86,248	$381,786	$381,786	$0
Year 10	2034	$0	$240,499	$60,950	$98,262	$399,711	$399,711	$0
Total		**$828,272**	**$2,400,802**	**$608,436**	**$2,308,714**	**$6,146,224**	**$5,355,679**	**-$790,545**

The lifecycle overview follows on the next page as Figure 7-24.

Figure 7-24: Lifecycle Overview



The most significant funding gap throughout the fleet lifecycle strategy is in 2025 and 2026, which is due to the replacement of two plow trucks and a pickup truck estimated to cost $841,250 altogether. Shortfalls in funding will be further reviewed by staff during in preparation for the 2025 Annual Budget and the Long-Term Capital Plan.

When considering opportunities to address funding in the lifecycle management plan, it is vital to recognize the potential to impact the level of service, and by extension, in the case of fleet, the capabilities of the organization.

7.5 Risk Management

Discussing risk management for fleet involves first understanding the key role vehicles have for other service areas. Recognizing that municipal services are directly dependent on fleet brings to light the importance of ensuring the category has the resources necessary to continue to operate at the desired level of service.

7.5.1 Critical Assets

Critical assets are those which have the highest consequence in the event of failure. Figure 7-25 provides a description of fleet assets that are likely to be considered critical.

Figure 7-25: Fleet Assets

Service Area	Critical Asset
Operations	Plow Trucks
Utilities	Pickup Trucks

7.5.2 Risk Assessment

When reviewing options to manage funding gaps in lifecycle activities, it is important to understand the relationship between underfunding or deferring an activity and the risk that may be introduced. Additionally, the related financial impact should be considered alongside each potential risk.

On the following page, Figure 7-26 showcases the relationship between lifecycle activities and the potential risk resulting from deferral or underfunding.

Figure 7-26: Lifecycle Activities and Potential Risk

Deferred Activity	Potential Risk
Acquisition	▪ Increased likelihood of deficiencies due to overuse ▪ Increased likelihood of safety issues due to overuse ▪ Increased likelihood of operating inefficiencies
Operation and Maintenance	▪ Increased likelihood of unresolved deficiencies ▪ Increased likelihood of reduced performance ▪ Increased likelihood of safety issues due to unresolved deficiencies
Replacement	▪ Increased likelihood of downtime due to age ▪ Increased likelihood of decreased performance due to age ▪ Increased likelihood of higher maintenance costs due to age

7.5.3 Potential Service Impact

If a critical fleet asset were to fail, an impact to multiple services is likely. Below, Figure 7-27 highlights these potential impacts to services.

In the context of fleet, it is important to remember there are currently more than one of each critical asset, such as multiple plow trucks. For the purpose of this document, it will be assumed that only one of the critical assets has failed, but other identical assets are still operational.

Figure 7-27: Potential Service Impacts

Service Area	Critical Asset	Potential Service Impact
Operations	Plow Trucks	▪ Reduced ability to perform winter control on roads ▪ Reduced ability to perform loose-leaf collection on roads ▪ Reduced ability to transport bulk materials for other service areas
Utilities	Pickup Trucks	▪ Reduce ability to transport equipment efficiently ▪ Reduced response time for calls for service from customers ▪ Reduced response effectiveness for emergency calls for service

7.5.4 Potential Consequences

Alongside the potential impacts to service are potential consequences for the organization. On the following page, Figure 7-28 outlines potential consequences due to critical asset failure, and a severity rating for each.

Figure 7-28: Potential Consequences

Consequence Type	Likelihood
Environmental	Unlikely
Financial	Likely
Health/Safety	Unlikely
Legal/Compliance	Unlikely
Operational	Likely
Reputational	Unlikely
Service Delivery	Likely

Evaluating the consequences of risk are vital when considering the deferral or underfunding of a lifecycle activity. In addition to the likelihood of each consequence, estimating the duration can bring a better understanding of the potential magnitude of each.

7.5.5 Climate Change

Factors associated with climate change have the ability to impact the lifecycle management plan of the fleet asset category. Figure 7-29 discusses some potential impacts of climate change and their relationship to fleet lifecycle activities.

Figure 7-29: Climate Change Risks

Factor	Potential Impact	Potential Lifecycle Risk
Frequency of Severe Weather	▪ Increased operating frequency of winter control vehicles. ▪ Increased likelihood of damage to exterior vehicle components.	▪ Higher frequency of renewals due to shorter vehicle service life. ▪ Higher maintenance costs due to more frequent repairs.
Higher Average Temperatures	▪ Increased operation of vehicle climate control systems for interior cooling.	▪ Higher maintenance costs due to more rapid wear and tear of climate control systems.
Regulatory and Legislative Changes	▪ Increased refuelling costs. ▪ Increased licensing costs. ▪ Increased pressure to transition to electric vehicles.	▪ Higher acquisition and renewal costs for electric vehicles. ▪ Higher operation costs due to refuelling, recharging, and licensing.
Seasonal Weather Variance	▪ Increased frequency of changes to vehicle outfitting.	▪ Higher operation and maintenance costs due to equipment installation and removal.

7.6 Recommendations

The fleet asset category is one of the strongest in the inventory in terms of the extent of up-to-date information available for each vehicle. However, two strategies will continue to strengthen fleet data.

First, a condition inspection workflow which mirrors the condition modelling capabilities of the Town's enterprise asset management software should be formalized. By adding visual inspection data to the inventory at regular intervals, staff will be able to conduct a more accurate estimate of the maintenance and renewal needs for each asset.

Second, staff should continue to review the useful life assigned to each vehicle type. It is likely that different types of pickup trucks based on duty rating (light vs heavy-duty) and fuel type (petrol vs diesel vs electric) could utilize a different service life. Ensuring that the useful life assigned to each asset best reflects its capabilities allows for more accurate acquisition and renewal forecasting.

Section 8 – Land Improvements

8.1 Quantity and Replacement Cost

Land improvement assets enhance the functionality and often provide a new use for the land they are constructed on. First, the quantity and replacement cost of the category is modelled compared to the related service area. Similar to machinery and equipment, the Utilities service area is separated into water and wastewater for section 8. Figure 8-1 outlines this data below.

Figure 8-1: Quantity and Replacement Cost (2024)

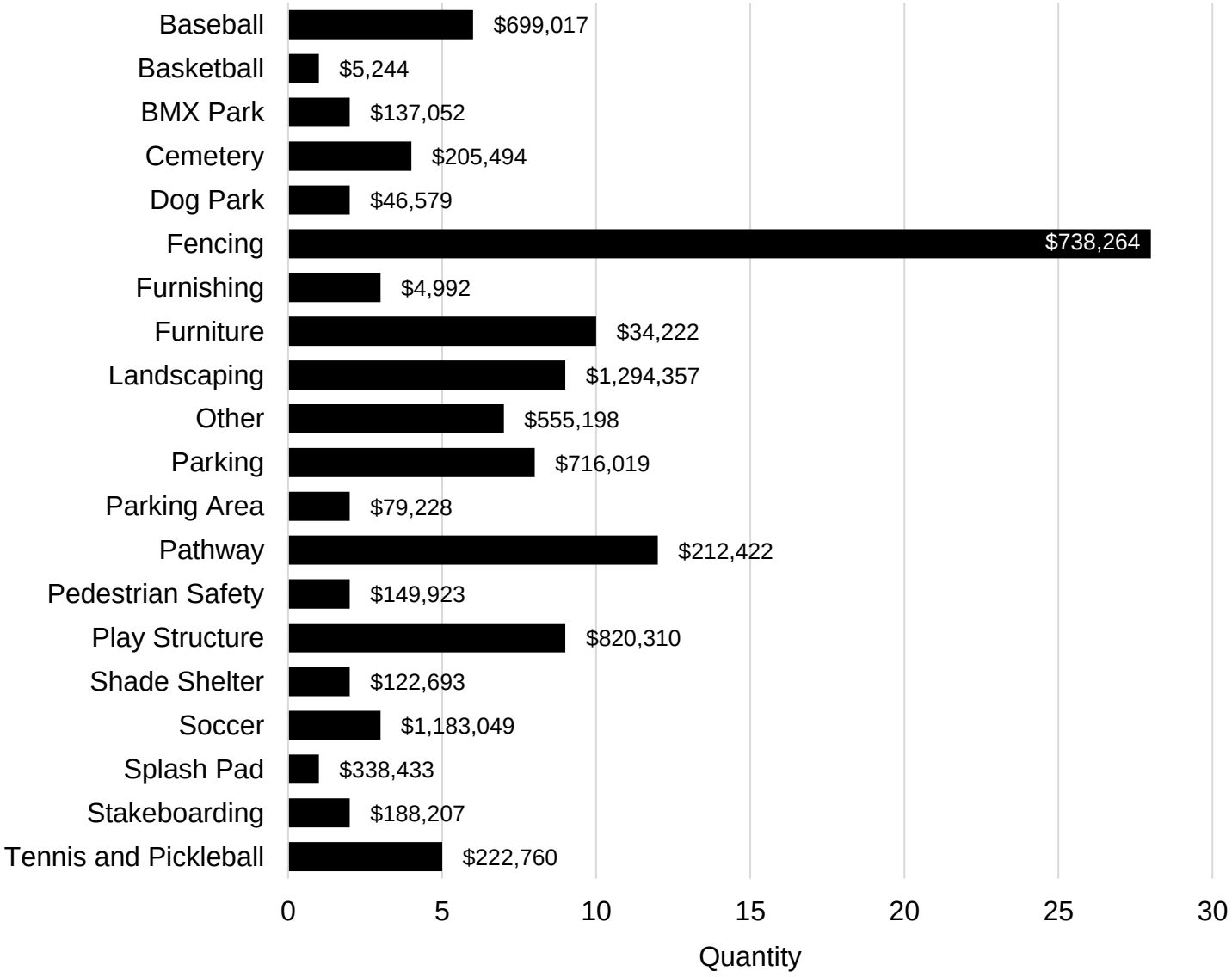
Service Area	Quantity	Replacement Cost
Administration	4	$209,124
Cemetery	9	$458,405
Operations	19	$784,938
Parks & Recreation	74	$4,798,411
Wastewater	1	$17,291
Water	11	$1,485,294
Total	**118**	**$7,753,463**

In the asset inventory, quantity is well represented for land improvement assets. There are few instances of "grouping" where multiple assets are recorded as one single entry. This allows not only for effective communication of quantity, but also for modeling replacement cost. Replacement cost for land improvement assets was calculated based on inflating the historical cost of each asset to the year 2024. This was largely due to the fact that many assets are missing sufficient information to assign a per-unit cost.

On the following page, Figure 8-2 categorizes land improvement assets based on their function, displays the quantity, and includes replacement cost. It should be noted that similar to other categories, large land improvements assets have been separated into components in the inventory. This results in one asset being represented as multiple quantity.

When reviewing quantity for the land improvements category, it is important to remember some facilities may not be labelled for their current use. An example might include open green space utilized as multiple small soccer pitches. The green space will not be recognized as multiple soccer pitches in an asset inventory. Recreation documents such as the 2023 Parks and Recreation Master Plan discuss the quantity of each facility and use.

Figure 8-2: Quantity by Type with Replacement Cost (2024)



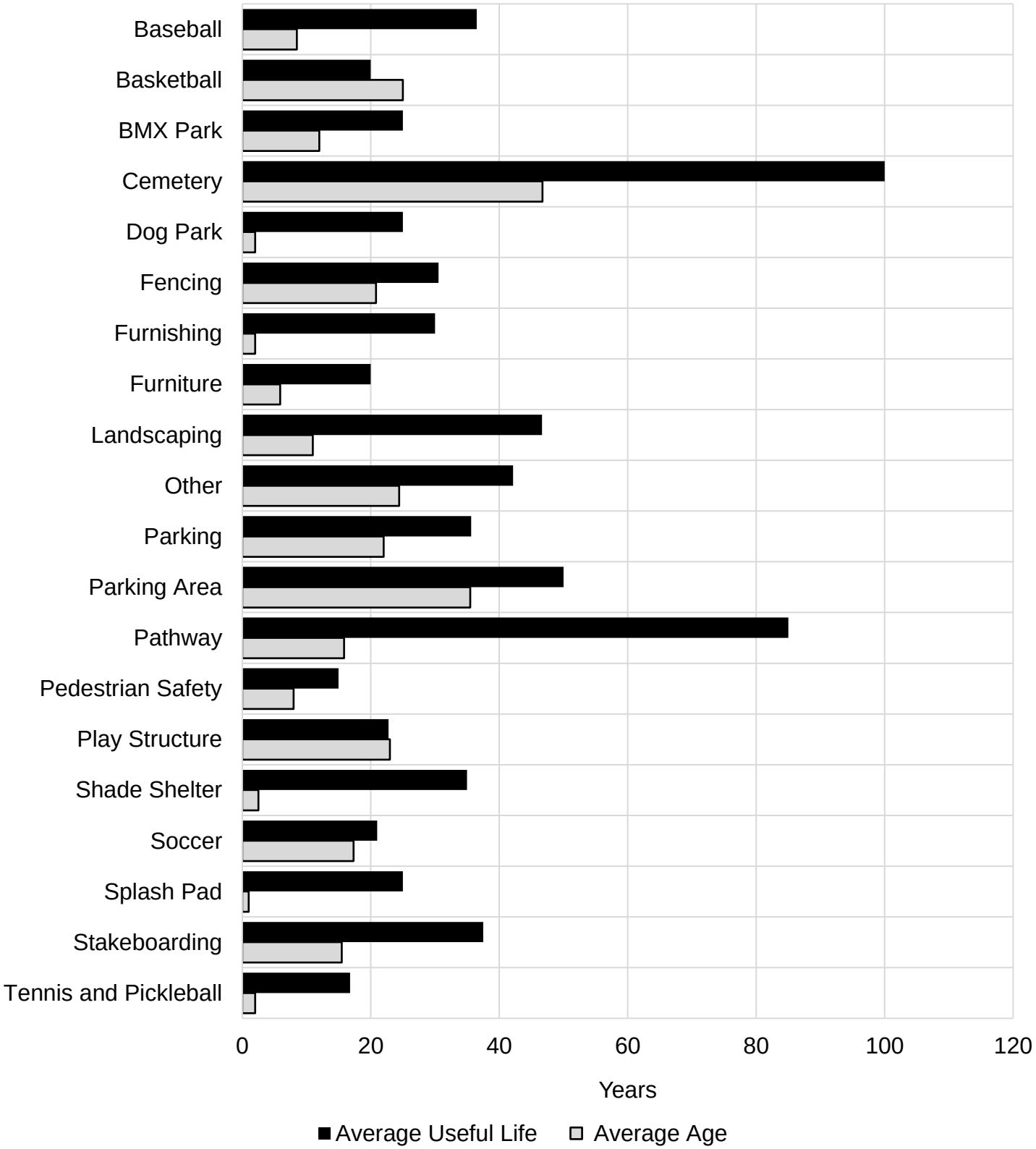
It is important to remember that larger land improvement facilities may be split into components. For example, the quantity of fencing may apply to other assets.

8.2 Age and Condition

8.2.1 Age

The useful life assigned to land improvement assets varies significantly depending on type, material, location, and use. This variance is present even within similar asset types. For this reason, Figure 8-3 summarizes the average useful life and average age for each asset type on the following page.

Figure 8-3: Average Useful Life and Average Age (2024)



8.2.2 Condition

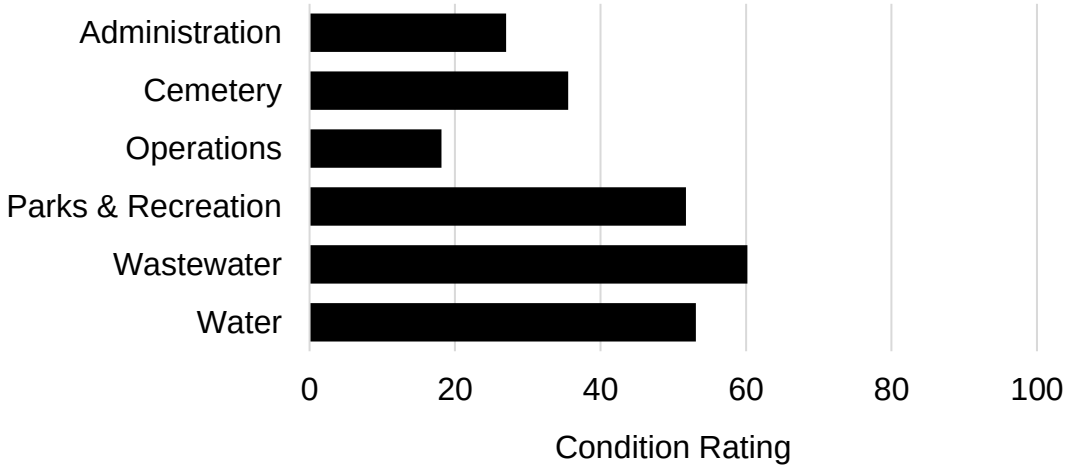
While several land improvement assets receive regular condition inspections in accordance with organizational priorities and legislation, this data has not been added to the asset inventory. This is due to the fact the format of field condition inspections must be translated to match how the Town's asset management software will interpret the results. As a result, age-based condition assessments will be referenced.

Figure 8-4 displays the applicable condition rating scale while Figure 8-5 showcases the average age-based condition rating by service area as of 2024.

Figure 8-4: Condition Rating Scale

Condition	Rating
Very Good	80.00 and above
Good	60.00 and above
Fair	40.00 and above
Poor	20.00 and above
Very Poor	0.00 and above

Figure 8-5: Average Age-Based Condition Rating (2024)



While the average condition displayed in Figure 8-5 does not provide further insight to land improvement assets by type, it communicates which service area is likely to require an additional level of investment compared to others.

8.3 Level of Service

Land improvements are directly connected to elevating the customer experience at each location. Seating and shade structures allow residents to enjoy outdoor recreation comfortably, while fences provide important designations between land use and ensure safety. Sport facilities provide an abundance of active recreational activities, and parking lots allow users to access those facilities.

As a result, the level of service provided by the category is an important discussion to ensure customers see value in service we provide.

8.3.1 Level of Service Objectives

To begin, level of service objectives are established to qualitatively define what aspects of the service residents value. For the Parks & Recreation service area, these are partly driven by the community priorities and expectations found in the 2023 Parks and Recreation Master Plan.

Below, Figure 8-6 outlines level of service objectives that are applicable for the land improvements asset category.

Figure 8-6: Level of Service Objectives

Service Parameter	Objective Statement
Accessibility	LI assets are designed to be accessible for all users.
Availability	LI assets are reasonably distributed throughout the community.
Capacity	LI assets meet the needs of the community.
Reliability	LI asset downtime is minimized by good maintenance practices.
Resilience	LI assets are constructed of quality materials to withstand our climate.
Responsiveness	Municipal staff are available for questions and assistance.

8.3.2 Performance Measures

Performance measures connect level of service objectives to quantifiable indicators of performance. Each measure is linked to the related service parameter.

On the following page, performance measures applicable to the land improvements category are found for each service area.

Figure 8-7: Performance Measures

Service Parameter	Performance Measure
Accessibility	Percent of assets that meet AODA standards, where applicable.
Availability	Average distance to reach 100 households.
Capacity	Average customer satisfaction rating from engagement surveys.
Reliability	Number of unplanned closures per year.
Resilience	Number of assets damaged per year due to severe weather events.
Responsiveness	Municipal staff response time to customer inquiries.

Refinement and data collection for performance measures is currently underway to ensure suitability for the July 1, 2025 requirements of Ontario Regulation 588/17. As a result, the current and target performance of each measure has been excluded for land improvements from the 2024 Asset Management Plan.

Please refer to section 8.3.1 and 8.3.2 for the Town's approach to measuring the performance of land improvement assets.

8.4 Lifecycle Strategy

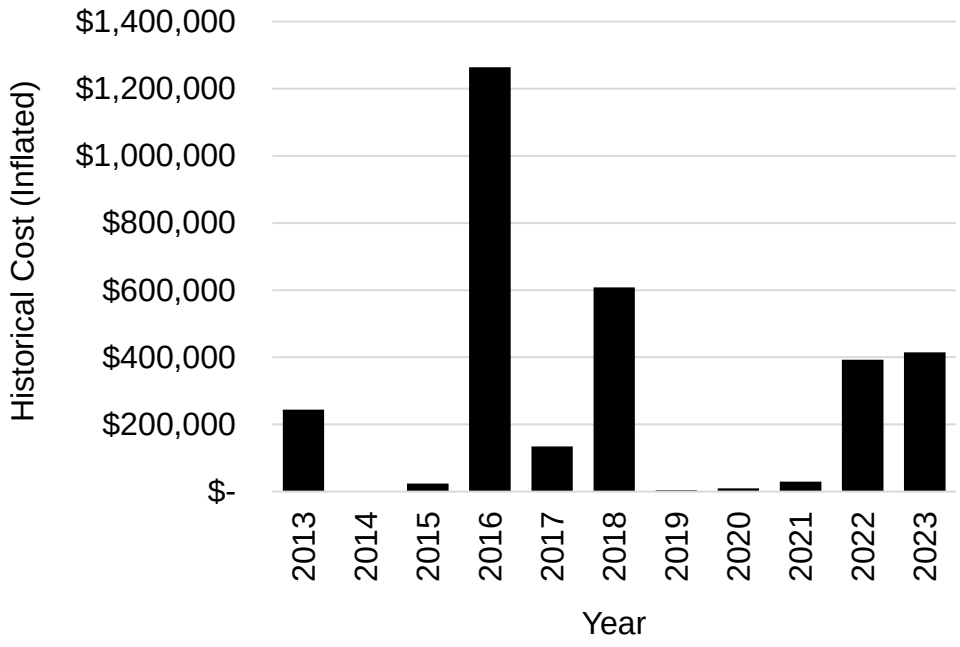
Assembling a lifecycle management plan for land improvements was guided by the 2024 Adopted Budget and 2023 Parks and Recreation Master Plan. For assets outside of those documents, staff reviewed the inventory and assessed each individual item.

The lifecycle management plan is intended to be a source of reference when making investment decisions regarding land improvement assets and is directly connected to maintaining the desired level of service.

8.4.1 Recent Investment

Figure 8-8 outlines recent investment in the land improvements category over a 10-year period. The data reflects acquisitions and renewals, and the historical cost of assets in scope have been inflated by 2% per year to 2024.

Figure 8-8: Recent Investment Overview



Reviewing Figure 8-8, significant peaks and valleys in the level of investment is indicated. Most notably in 2016 are acquisitions and renewals totaling $1,263,473. This includes over $425,000 dedicated to baseball facilities at Hyland Park and the remaining $838,473 being distributed across multiple land improvements associated with water structures.

8.4.2 Acquisition

The 2023 Parks and Recreation Master Plan outlined a significant number of acquisitions for the land improvements category. Figure 8-9 highlights a subset of acquisitions over the next three years.

Figure 8-9: Projected Upcoming Acquisitions

Year	Service Area	Description	Projected Cost
2024	Parks & Recreation	Greenwood Park Splash Pad Shade Structure	$140,000
2024	Parks & Recreation	Hyland Park Play Structure	$350,000
2025	Parks & Recreation	Greenwood Park Tansley St Parking Area	$235,000
2025	Parks & Recreation	Simon Street Park Basketball Half Court	$40,000
2026	Cemetery	48-Unit Columbarium	$32,000
2026	Parks & Recreation	Summerhill Park Multi-Use Court	$125,000

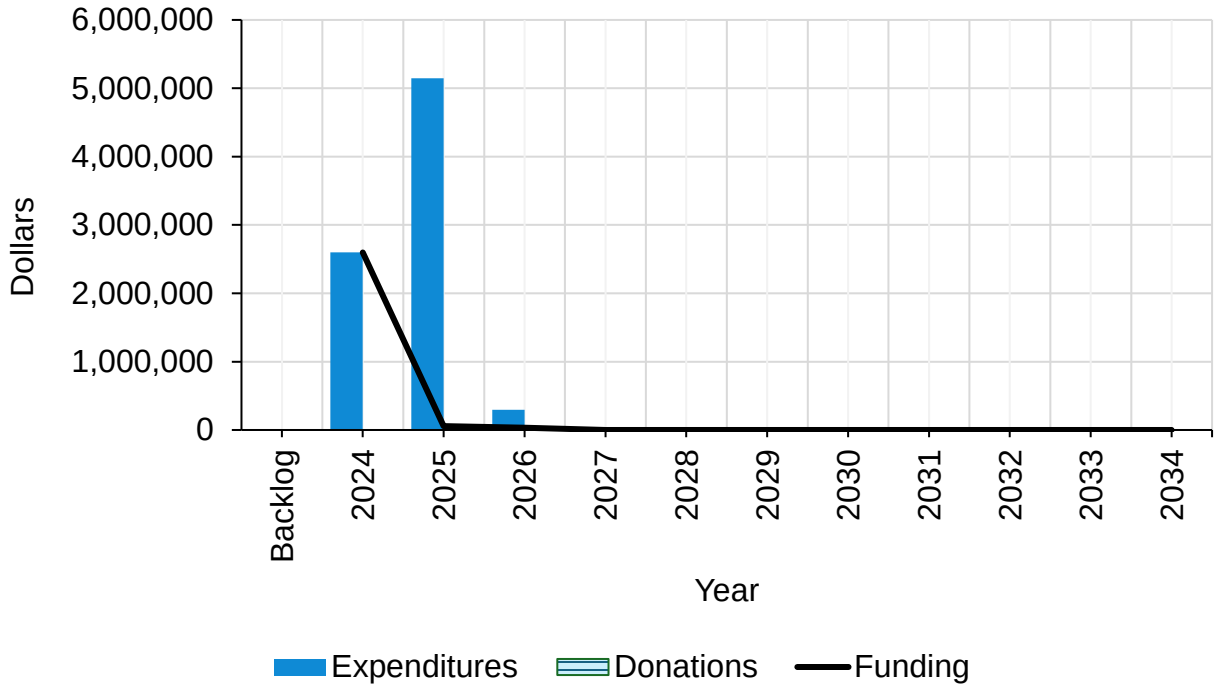
Figure 8-10 outlines forecasted acquisition costs.

Figure 8-10: Projected Acquisition Expenditures

Planning Period	Year	Projected Expenditures	Projected Donations	Projected Funding	Balance
Backlog	Backlog	$0	$0		$0
Year 0	2024	$2,597,234	$0	$2,597,234	$0
Year 1	2025	$5,146,152	$0	$55,000	-$5,091,152
Year 2	2026	$297,000	$0	$32,000	-$265,000
Year 3	2027	$0	$0	$0	$0
Year 4	2028	$0	$0	$0	$0
Year 5	2029	$0	$0	$0	$0
Year 6	2030	$0	$0	$0	$0
Year 7	2031	$0	$0	$0	$0
Year 8	2032	$0	$0	$0	$0
Year 9	2033	$0	$0	$0	$0
Year 10	2034	$0	$0	$0	$0
Total		**$8,040,386**	**$0**	**$2,684,234**	**-$5,356,152**

On the following page, Figure 8-11 showcases the acquisition overview.

Figure 8-11: Acquisition Overview



Over the 10-year planning period, a total funding gap of $5,356,152 is indicated for the land improvements category. As mirrored in the 2024 Adopted Budget, this is due to the significant level of investment outlined for Parks & Recreation assets in the 2023 Parks and Recreation Master Plan. The 2024 Adopted Budget specifies that there are not enough DC reserves available to fund these projects from 2025 through to 2028.

If funding were secured for each of these projects, it should be noted that each acquisition will likely be accompanied by additional operating and maintenance costs, and ultimately renewal costs. In order to strategically support capital assets, it is vital to allocate regular funding, whether toward lifecycle costs or reserves, to ensure extra finances are available for high-value projects. If these acquisitions remain unfunded, an examination of the potential impact to the level of service should be conducted.

8.4.3 Operation and Maintenance

An analysis of operation and maintenance costs was conducted through consultation with staff to determine the proactive and reactive activities that support the category. On the following page, operation expenditures is presented as Figure 8-12.

Figure 8-12: Projected Operation Expenditures

Planning Period	Year	Primary Expenditures	Secondary Expenditures	Total Projected Expenditures	Projected Funding	Balance
Year 0	2024	$558,884	$0	$558,884	$558,884	$0
Year 1	2025	$569,533	$125,000	$694,533	$694,533	$0
Year 2	2026	$657,682	$0	$657,682	$657,682	$0
Year 3	2027	$670,836	$0	$670,836	$670,836	$0
Year 4	2028	$684,252	$0	$684,252	$684,252	$0
Year 5	2029	$697,938	$0	$697,938	$697,938	$0
Year 6	2030	$711,896	$0	$711,896	$711,896	$0
Year 7	2031	$726,134	$0	$726,134	$726,134	$0
Year 8	2032	$740,657	$0	$740,657	$740,657	$0
Year 9	2033	$755,470	$0	$755,470	$755,470	$0
Year 10	2034	$770,579	$0	$770,579	$770,579	$0
Total		**$7,543,862**	**$125,000**	**$7,668,862**	**$7,668,862**	**$0**

Next, maintenance expenditures are shown in Figure 8-13.

Figure 8-13: Projected Maintenance Expenditures

Planning Period	Year	Primary Expenditures	Secondary Expenditures	Total Projected Expenditures	Projected Funding	Balance
Year 0	2024	$213,081	$614,633	$827,714	$827,714	$0
Year 1	2025	$222,243	$0	$222,243	$222,243	$0
Year 2	2026	$226,687	$0	$226,687	$226,687	$0
Year 3	2027	$231,221	$50,000	$281,221	$281,221	$0
Year 4	2028	$235,846	$0	$235,846	$235,846	$0
Year 5	2029	$240,563	$0	$240,563	$240,563	$0
Year 6	2030	$245,374	$0	$245,374	$245,374	$0
Year 7	2031	$250,281	$0	$250,281	$250,281	$0
Year 8	2032	$255,287	$0	$255,287	$255,287	$0
Year 9	2033	$260,393	$0	$260,393	$260,393	$0
Year 10	2034	$265,601	$0	$265,601	$265,601	$0
Total		**$2,646,576**	**$664,633**	**$3,311,209**	**$3,311,209**	**$0**

On the following page, Figure 8-14 and 8-15 highlight the operation and maintenance overviews.

Figure 8-14: Operation Overview

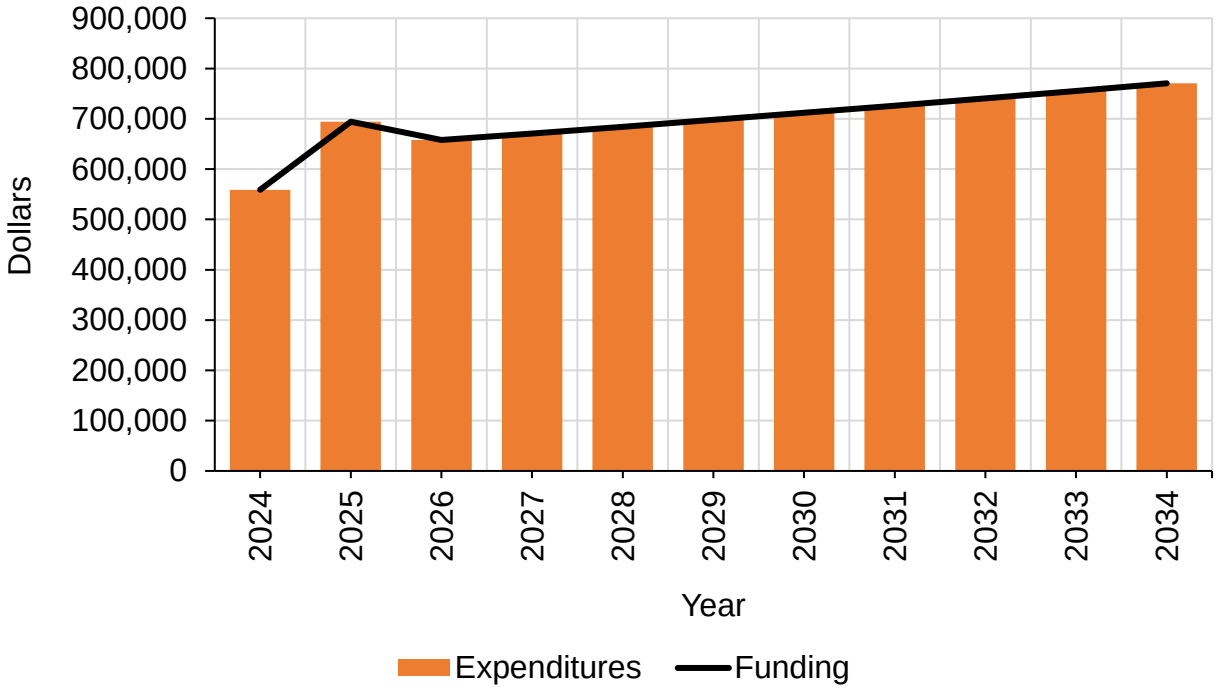
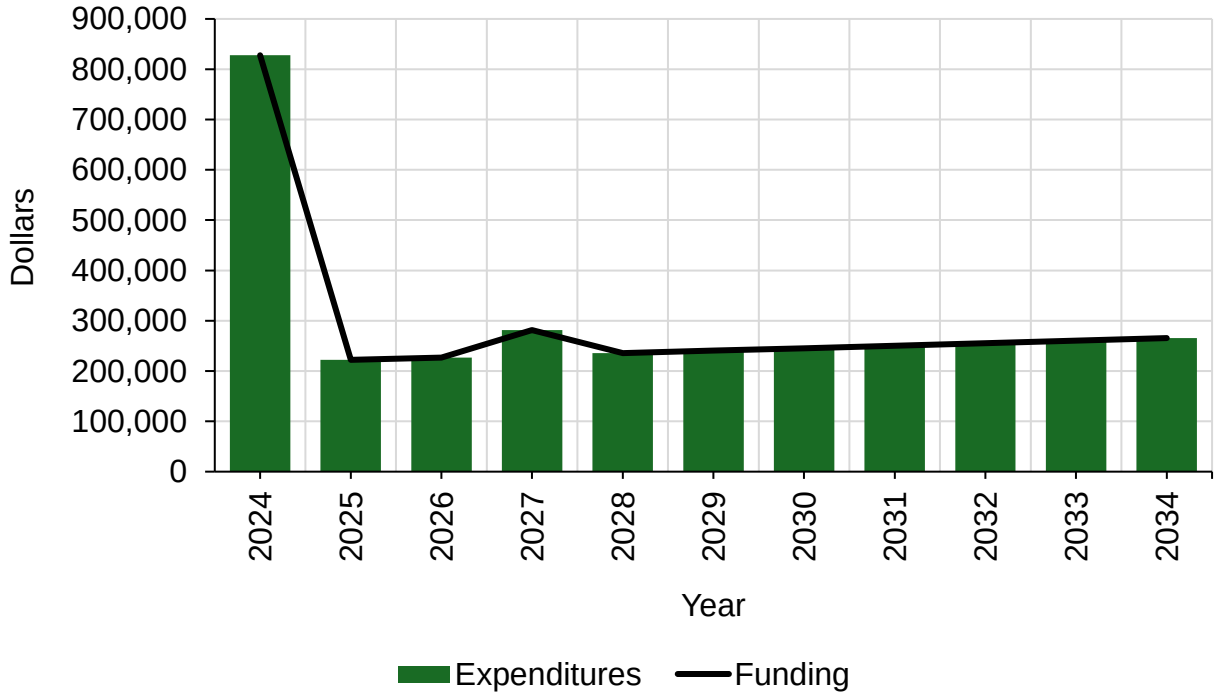


Figure 8-15: Maintenance Overview



To accompany the visualizations, an example of the operation and maintenance activities for the category is found in Figures 8-16 and 8-17.

Figure 8-16: Operation Activities

Activity	Interval	Description	Purpose
Dog Park Inspection	Weekly	Fence, gates, and surface is inspected for deficiencies. Garbage receptacles emptied.	Identification of deficiencies and maintained safety and performance.
Playground Inspection	Multiple Intervals	Playground components and surface are inspection for deficiencies.	Identification of deficiencies and maintained safety. Compliance with playground legislation.
Trail Inspections	Monthly	Trail surface is inspected for deficiencies.	Maintained performance and safety of trail surface.
Splash Pad Inspection	Daily	Chemicals, pumps, recirculation, contact times, equipment, and surface are inspected.	Maintained splash pad component performance.

Figure 8-17: Maintenance Activities (Table 1 of 2)

Activity	Interval	Description	Purpose
Baseball Diamond Dragging	4 Times per Week	Baseball diamond is dragged to level and refresh infield.	Maintained diamond performance and aesthetics.
Garbage Collection	Twice per Week	Garbage receptacles emptied.	Maintained cleanliness of facilities.
Garden Maintenance	Daily	Gardens, hanging baskets, and street planters are watered and weeded.	Maintained gardens and furnishings.
General Built Asset Maintenance	As Needed	Specialty work for welding, graffiti removal, and inspections.	Maintained asset performance and correction of deficiencies.
Irrigation System Maintenance	Annually	Irrigation system maintenance for seasonal start up and shut down.	Maintained irrigation system performance.

Figure 8-17: Maintenance Activities (Table 2 of 2)

Activity	Interval	Description	Purpose
Limestone Trail Maintenance	Annually	Reapplication and grading of surface material.	Maintained trail performance.
Municipal Tree Maintenance	As Needed	Boulevard and park trees are trimmed, removed, stumps grinded, and new trees planted.	Maintained natural assets and boulevard aesthetics.
Open Spaces Grass Maintenance	Weekly	Grass is trimmed.	Maintained parkland aesthetics.
Outdoor Skating Rink Maintenance	Daily	Ice surface is inspected, rink is shoveled and flooded.	Maintained rink performance.
Public Washroom Cleaning	Daily	Washroom is cleaned and supplies restocked.	Maintained cleanliness, hygiene, and performance of washrooms.
Public Washroom Winterization	Seasonally	Water meter is removed and antifreeze is added to water lines.	Maintained washroom performance.
Sports Field Grass Maintenance	Weekly	Sports field grass is trimmed.	Maintained sports field performance and aesthetics.
Sports Field Grass Maintenance	Annually	Seeding, fertilizing, top-dressing, and aeration.	Maintained sports field performance and aesthetics.
Sports Field Weed Spraying	Seasonally	Sports fields are sprayed for weed control.	Maintained sports field performance and aesthetics.
Winter Maintenance	As Needed	Parking lot and select trails plowed, salt and sand applied as needed.	Maintained safety of parking areas and trails during winter months.

Additional demand for funding should be expected beginning in 2025 with the onset of $5,146,152 in planned asset acquisitions. As stated previously, the additional operation and maintenance costs are likely to be proportionate to current operation and maintenance expenses compared to the total number of assets. The operation and maintenance expense categories most likely to increase due to the type of forecasted land improvement acquisitions are:

- Labour
- Maintenance supplies

Contributing to costs, the secondary expenditures column highlights non-recurring costs in the amount of $125,000 for operation and $664,663 for maintenance. These are reflective of the below two projects:

- Facility condition assessment in 2025
- Existing asset improvements in 2024 and 2027

8.4.4 Replacement

Developing a replacement strategy for the land improvements category involved consulting existing documents such as the 2024 Adopted Budget and 2023 Parks and Recreation Master Plan. For assets in the inventory that were outside of these documents, staff evaluated each item to estimate a likely replacement date.

Figure 8-18 outlines upcoming asset replacements.

Figure 8-18: Projected Upcoming Replacements

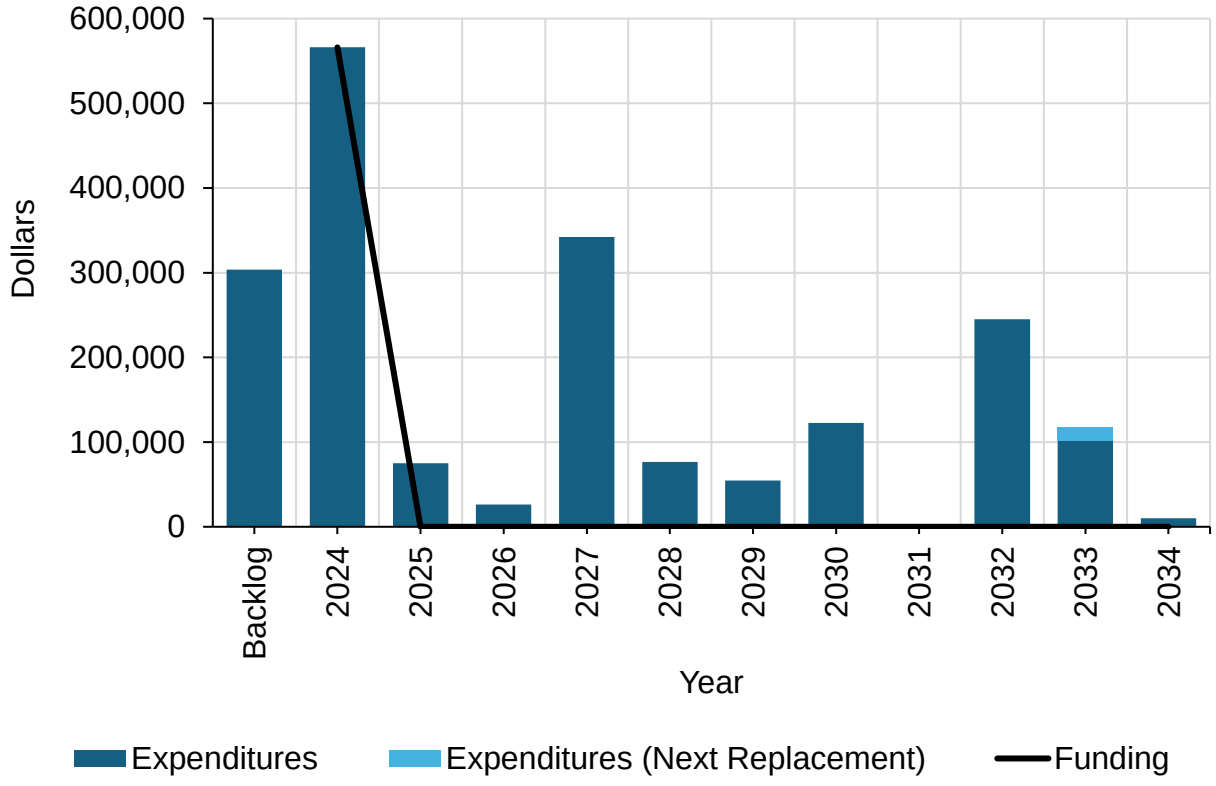
Year	Service Area	Asset ID	Description	Projected Cost
2024	Parks & Recreation	Pending	Greenwood Park Limestone Pathways	$446,000
2024	Parks & Recreation	14481	Walter's Creek Park Play Structure	$120,000
2025	Parks & Recreation	Pending	Simon Street Park Parking Area	$30,000
2027	Parks & Recreation	Pending	Greenwood Park Play Structure	$200,000
2027	Parks & Recreation	Pending	Greenwood Crescent Park Play Structure	$75,000

On the following page, replacement expenditures are summarized as Figure 8-19, and the replacement overview is found in Figure 8-20.

Figure 8-19: Projected Replacement Expenditures

Planning Period	Year	Projected Expenditures	Projected Funding	Balance
Backlog	Backlog	$303,743		-$303,743
Year 0	2024	$566,000	$566,000	$0
Year 1	2025	$75,204	$0	-$75,204
Year 2	2026	$26,210	$0	-$26,210
Year 3	2027	$342,253	$0	-$342,253
Year 4	2028	$76,613	$0	-$76,613
Year 5	2029	$54,735	$0	-$54,735
Year 6	2030	$122,472	$0	-$122,472
Year 7	2031	$0	$0	$0
Year 8	2032	$245,131	$0	-$245,131
Year 9	2033	$117,179	$0	-$117,179
Year 10	2034	$9,872	$0	-$9,872
Total		**$1,939,412**	**$566,000**	**-$1,373,412**

Figure 8-20: Replacement Overview



As mentioned at the start of section 8.4.4, staff reviewed land improvement assets outside of those captured in other documents, such as the 2023 Parks and Recreation Master Plan, and selected a year for replacement where applicable. In circumstances where staff were unable to assign a replacement date, often due to more information being required, the asset was left as the year its useful life ended as that was the only source of data.

This results in many assets showing as backlog (22% of deficit) or with unallocated funding. Backlog assets are those with a service life which has expired prior to 2024. To improve replacement data, staff will continue to evaluate assets, with a focus on those in the backlog, determine the appropriate replacement date for each, and assign the appropriate level of funding.

8.4.5 Lifecycle Overview

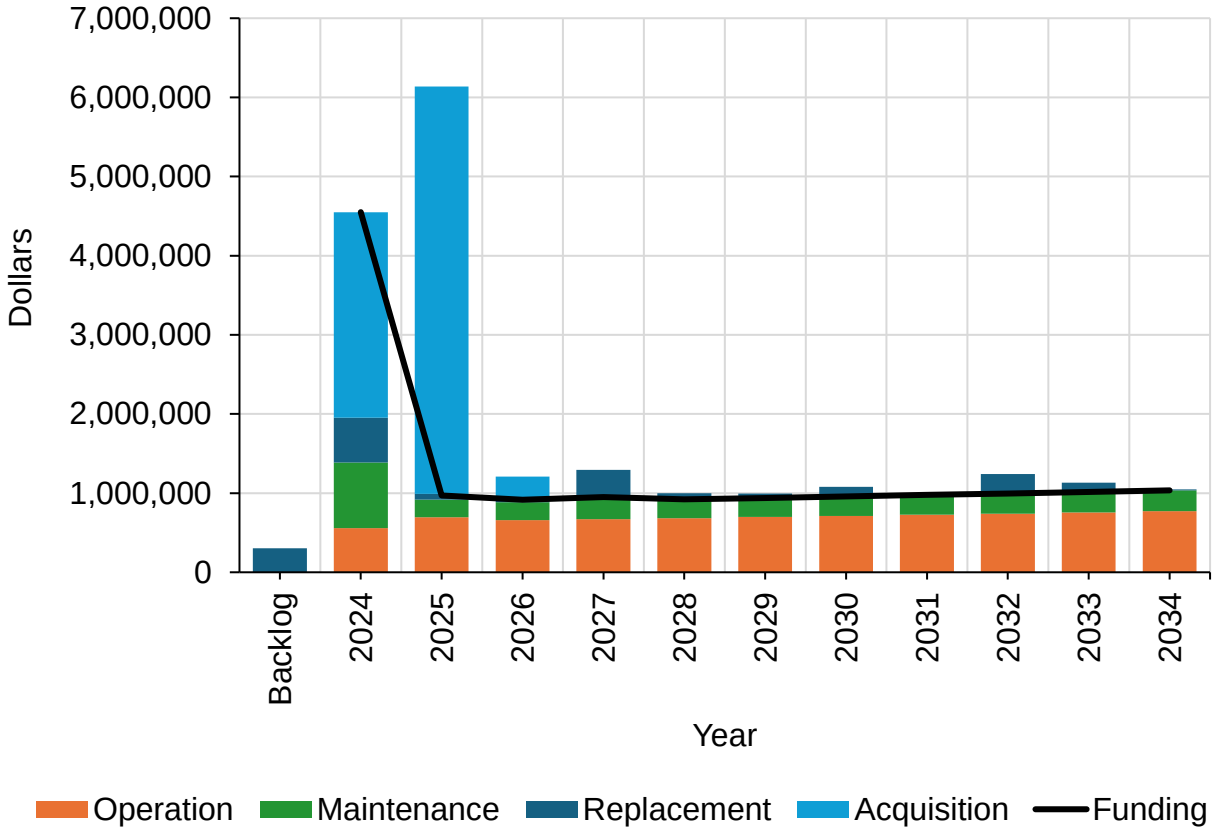
To fully visualize the forecasted level of investment for the land improvements category, the lifecycle expenditures table appears on the following page as Figure 8-21.

Figure 8-21: Projected Lifecycle Expenditures

Planning Period	Year	Acquisition	Operation	Maintenance	Replacement	Total Expenditures	Total Funding	Balance
Backlog	Backlog	$0			$303,743	$303,743		-$303,743
Year 0	2024	$2,597,234	$558,884	$827,714	$566,000	$4,549,832	$4,549,832	$0
Year 1	2025	$5,146,152	$694,533	$222,243	$75,204	$6,138,132	$971,776	-$5,166,356
Year 2	2026	$297,000	$657,682	$226,687	$26,210	$1,207,580	$916,370	-$291,210
Year 3	2027	$0	$670,836	$281,221	$342,253	$1,294,310	$952,057	-$342,253
Year 4	2028	$0	$684,252	$235,846	$76,613	$996,711	$920,098	-$76,613
Year 5	2029	$0	$697,938	$240,563	$54,735	$993,235	$938,500	-$54,735
Year 6	2030	$0	$711,896	$245,374	$122,472	$1,079,742	$957,270	-$122,472
Year 7	2031	$0	$726,134	$250,281	$0	$976,415	$976,415	$0
Year 8	2032	$0	$740,657	$255,287	$245,131	$1,241,075	$995,944	-$245,131
Year 9	2033	$0	$755,470	$260,393	$117,179	$1,133,042	$1,015,863	-$117,179
Year 10	2034	$0	$770,579	$265,601	$9,872	$1,046,052	$1,036,180	-$9,872
Total		**$8,040,386**	**$7,668,862**	**$3,311,209**	**$1,939,412**	**$20,959,869**	**$14,230,304**	**-$6,729,564**

On the following page, the lifecycle overview is outlined in Figure 8-22.

Figure 8-22: Lifecycle Overview



As noted for other asset categories, it is vital to remember when evaluating opportunities to address gaps in funding that deferring lifecycle activities have a direct impact on overall the level of service. In the context of land improvements, the connection between level of service and the customer experience is significant.

8.5 Risk Management

Many land improvements assets have equal or similar assets located throughout town. This reduces the likelihood of service disruption in the event of asset failure. However, some assets are unique, and a duplicate does not exist elsewhere, such as full-size sport facilities or splash pads. For this reason, it is important to assess risk for the land improvements category.

8.5.1 Critical Assets

Critical assets deliver the highest impact to services and carry the most severe consequence in the event of failure. Figure 8-23 explores critical assets within the land improvements category.

Figure 8-23: Critical Assets

Service Area	Description
Parks & Recreation	Lisa McKechnie Memorial Field (baseball)
Parks & Recreation	Rotary Splash Pad at Greenwood Park
Parks & Recreation	Thunder Field (soccer)

8.5.2 Risk Assessment

The land improvements category has a significant funding gap totaling $8,164,656 over the 10-year period. To manage the gap, lifecycle activities will need to be strategically managed to not impact the level of service or introduce risk.

On the following page, Figure 8-24 outlines the relationship between deferring a lifecycle activity and the potential risk.

Figure 8-24: Lifecycle Activities and Potential Risk

Deferred Activity	Potential Risk
Acquisition	▪ Increased likelihood of safety issues due to over capacity ▪ Increased likelihood of more frequent deficiencies due to overuse ▪ Increased likelihood of higher maintenance costs due to overuse ▪ Increased likelihood of customer dissatisfaction
Operation and Maintenance	▪ Increased likelihood of unresolved deficiencies ▪ Increased likelihood of downtime due to unresolved deficiencies ▪ Increased likelihood of safety issues due to unresolved deficiencies ▪ Increased likelihood of reduced aesthetics ▪ Increased likelihood of customer dissatisfaction
Replacement	▪ Increased likelihood of downtime due to unresolved deficiencies ▪ Increased likelihood of decreased performance due to age ▪ Increased likelihood of higher maintenance costs due to age ▪ Increased likelihood of customer dissatisfaction

8.5.3 Potential Service Impact

Should a critical land improvement asset fail, the service it provides would be disrupted. Given the nature of assets in the category, this has the potential to impact a significant number of users.

On the following page, Figure 8-25 suggests potential service impacts in the event of critical asset failure.

Figure 8-25: Potential Service Impacts

Service Area	Critical Asset	Potential Service Impact
Parks & Recreation	Lisa McKechnie Memorial Field (baseball)	▪ Unable to accommodate baseball games requiring illumination ▪ Disruption to organized recreation leagues
Parks & Recreation	Rotary Splash Pad at Greenwood Park	▪ Unable to provide as a heat relief option for users who do not have access to cooling ▪ Unable to provide similar service as an alternative
Parks & Recreation	Thunder Field (soccer)	▪ Unable to accommodate soccer games requiring illumination ▪ Disruption to organized recreation leagues

8.5.4 Potential Consequences

In the event of critical asset failure, it is likely the Town would experience consequences in addition to service disruption. Figure 8-26 outlines potential consequences.

Figure 8-26: Potential Consequences

Consequence Type	Likelihood
Environmental	Unlikely
Financial	Likely
Health/Safety	Unlikely
Legal/Compliance	Unlikely
Operational	Unlikely
Reputational	Likely
Service Delivery	Likely

Understanding the significance of each consequence type is critical to factor into decision making when balancing lifecycle funding. Due to critical land improvement assets being the sole source of providing a specific tier of recreation, the reputational consequences are likely to be high. It should also be understood that an unlikely consequence does not mean impossible.

8.5.5 Climate Change

The potential factors of climate change are likely to impact the operation of the land improvement category, particularly due to assets being directly exposed to the elements.

On the following page, Figure 8-27 suggests potential impacts of climate change, along with a risk to the lifecycle activities.

Figure 8-27: Climate Change Risks

Factor	Potential Impact	Potential Lifecycle Risk
Frequency of Severe Weather	▪ Increased frequency of damage to asset structural components. ▪ Increased frequency of damage to natural assets.	▪ Higher frequency of renewals due to shorter asset service life. ▪ Higher maintenance costs due to more frequent repairs.
Higher Average Temperatures	▪ Increased rate of wear and tear of structural components. ▪ Increased usage of cooling assets, such as splash pads.	▪ Higher frequency of renewals due to shorter asset service life. ▪ Higher maintenance costs due to more rapid wear and tear. ▪ Higher maintenance costs for grass management.
Increased Precipitation	▪ Increased frequency of damage to sport field and pathway surfaces. ▪ Increased frequency of damage to surface of parking facilities.	▪ Higher maintenance costs due to more rapid wear and tear. ▪ Higher renewal costs for more resilient construction.
Seasonal Weather Variance	▪ Increased rate of wear and tear due to more frequent contraction and expansion.	▪ Higher operation and maintenance costs due to more rapid wear and tear.

8.6 Recommendations

Refinements to the land improvements category are focused on the data available in the asset inventory.

First, a strategy to integrate visual condition inspection data into the asset inventory should be prioritized. Due to many land improvements being focused on recreation, having the most up to date condition rating would allow for a more effective structuring of the lifecycle management plan, especially from a liability standpoint.

Second, continue to collect information on assets in the inventory with a depleted useful life. While the useful life of an asset is only an estimate and can be impacted by a number of factors, it is an overall indication of the age of an item, which is directly related to condition.

Section 9 – Machinery and Equipment

9.1 Quantity and Replacement Cost

The quantity of machinery and equipment (ME) assets is visualized in Figure 9-1 by service area with replacement cost as of 2024. Throughout section 9, the Utilities service area will be separated into Water and Wastewater for data simplification purposes.

Figure 9-1: Quantity and Replacement Cost (2024)

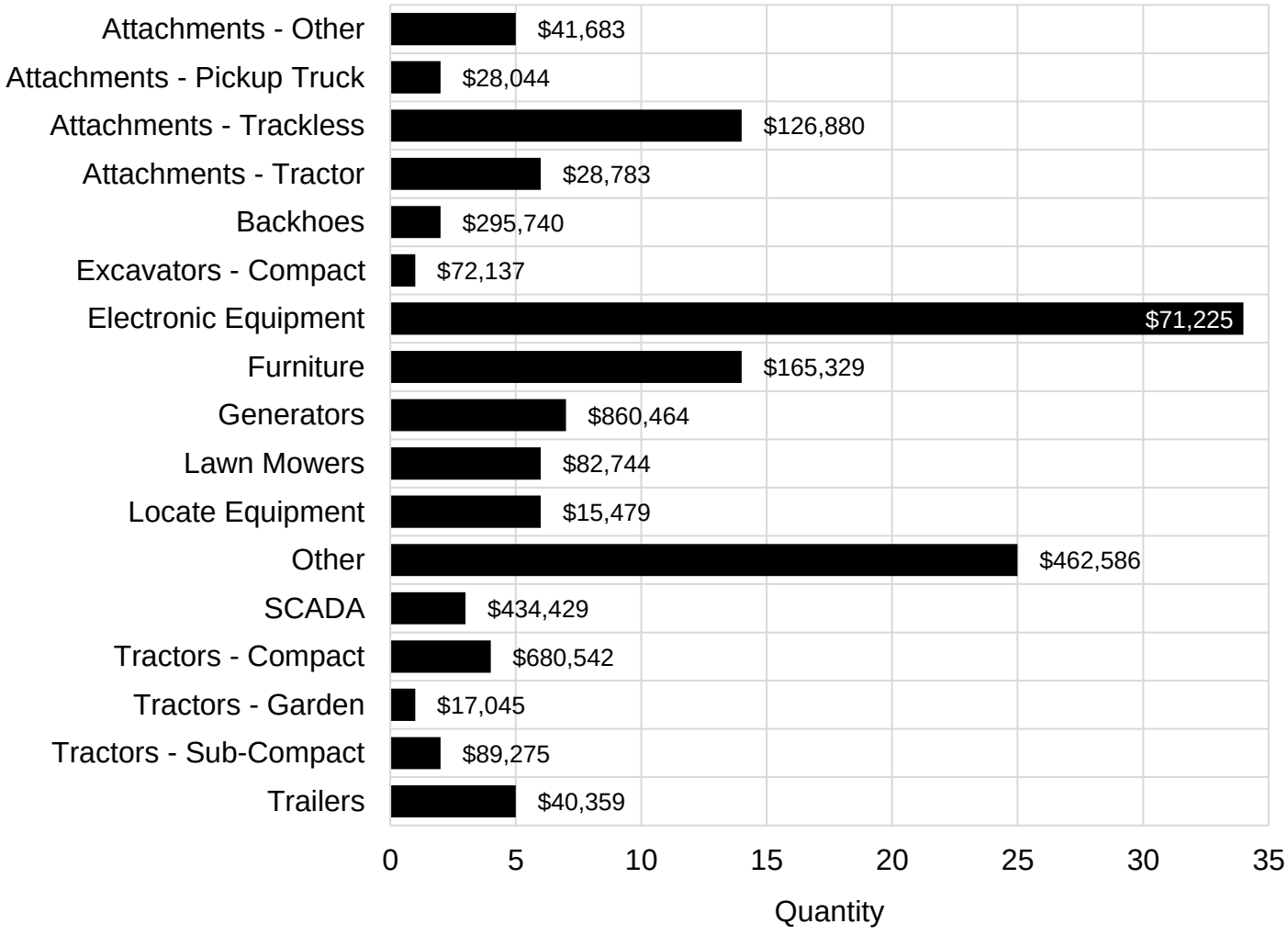
Service Area	Quantity	Replacement Cost
Administration	22	$525,193
Cemetery	2	$32,004
Parks & Recreation	9	$81,217
Operations	83	$1,606,189
Wastewater	5	$596,893
Water	16	$671,248
Total	**137**	**$3,512,744**

Over 85% of assets in the machinery and equipment asset category have a replacement cost calculated by inflating the historical cost to 2024. For the remaining 15%, staff estimates were leveraged based off of recent quotes or invoices for similar items.

As an alternative to service area, Figure 9-2 separates assets in the category by equipment type. Due to the presence of many dissimilar items existing in minimal quantities, several “other’ types have been included.

Figure 9-2 is found on the following page.

Figure 9-2: Quantity by Type with Replacement Cost (2024)



9.2 Age and Condition

9.2.1 Age

The machinery and equipment category houses a wide range of assets each with unique qualities that result in many different useful life durations. While consistency is used for identical assets, the data cannot be reasonably visualized in this document.

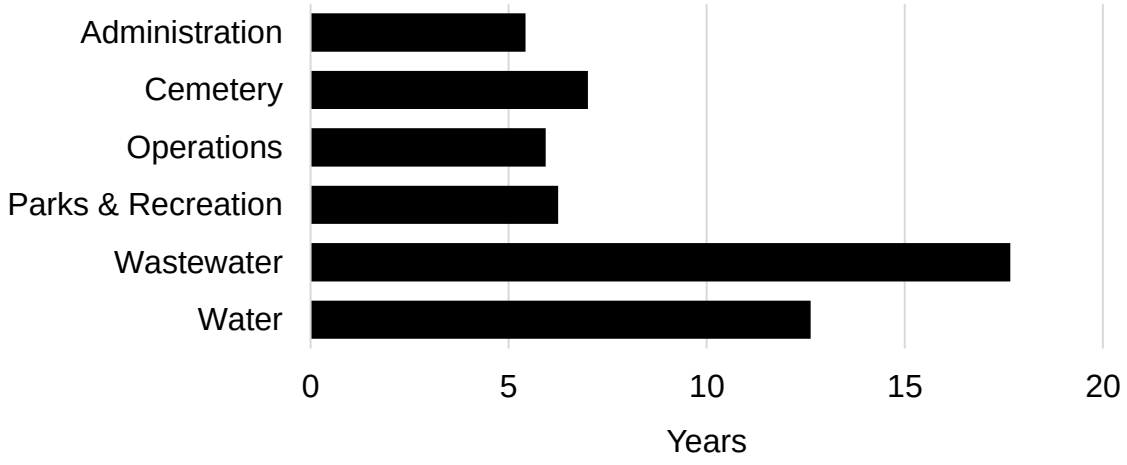
An example of the useful life assigned to select asset types is shown in Figure 9-3 on the following page.

Figure 9-3: Useful Life and Average Age (2024)

Asset Description	Useful Life	Average Age
Backhoe	10 Years	13 Years
Generator	15-30 Years	12 Years
GPS, Radios, Sensors	12 Years	5 Years
Trackless Attachment	10 Years	10 Years
Trackless Compact Tractor	10 Years	9 Years
Zero Turn Lawn Mower	8 Years	4 Years

Building on the above, the average remaining useful life of assets in each service area is highlighted in Figure 9-4.

Figure 9-4: Average Remaining Useful Life (2024)



9.2.2 Condition

In the asset inventory, condition data for machinery and equipment assets is fully modeled as an age-based estimate. Staff conduct regular inspections of assets and are aware of the detailed condition, but this data has not yet been translated into a format that can be incorporated into the Town's asset inventory.

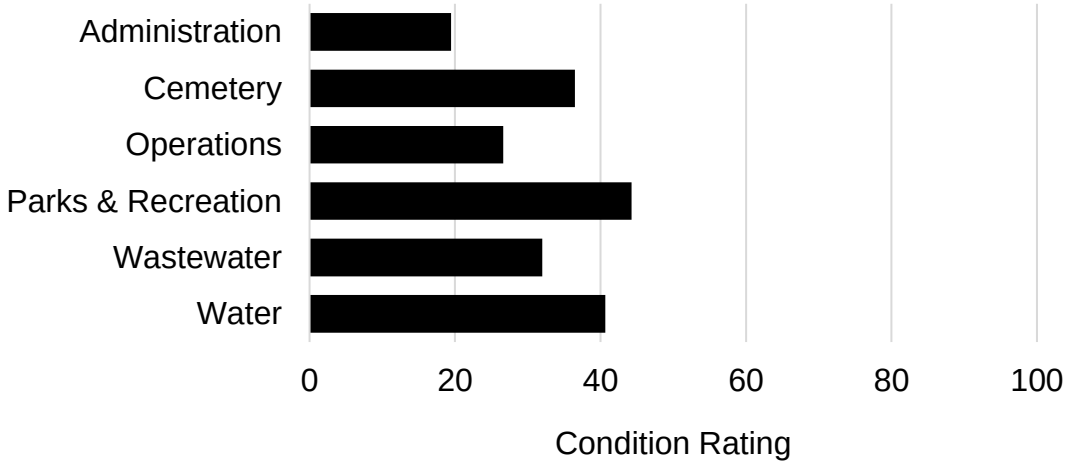
The age-based condition rating scale is found in Figure 9-5 on the following page.

Figure 9-5: Condition Rating Scale

Condition	Rating
Very Good	80.00 and above
Good	60.00 and above
Fair	40.00 and above
Poor	20.00 and above
Very Poor	0.00 and above

Below, Figure 9-6 showcases the average age-based condition rating by service area.

Figure 9-6: Average Age-Based Condition Rating



When analyzing the data found in Figure 9-6, one notable contrast to Figure 9-4 is the indication of a high average remaining useful life for assets in the wastewater service area, while the average age-based condition rating is less than fair. This is due to the fact that there are a low quantity of wastewater assets in the category and a wide variance of age and useful life is utilized. Similar patterns are likely to impact other service areas in these visuals.

9.3 Level of Service

Similar to the fleet asset category, machinery and equipment assets support a multitude of municipal services, including playing a key role in the organization's strategy for emergency preparedness. Understanding what elements of this category are valued is the first step to defining level of service.

9.3.1 Level of Service Objectives

To outline what aspects of the machinery and equipment category are valued or important, level of service objectives are used. These objectives serve as qualitative statements that reflect the priorities of residents and our organization at a high level.

Figure 9-7 explores applicable level of service objectives.

Figure 9-7: Level of Service Objectives

Service Parameter	Objective Statement
Availability	ME assets can support multiple field operations simultaneously.
Capacity	ME assets are suitable to meet the needs of the organization.
Quality	ME assets are maintained to a high degree of performance.
Reliability	ME assets are maintained in a manner which minimizes downtime.
Responsiveness	Municipal staff are available for questions and assistance.
Safety	ME assets are operated in a manner which ensures safety.

Level of service discussions continue on the following page.

9.3.2 Performance Measures

To shift the qualitative level of service objectives into quantifiable data, performance measures are introduced. Each service parameter identified in section 9.3.1 is used as a guideline for structuring performance indicators. Applicable performance measures are outlined in Figure 9-8.

Figure 9-8: Performance Measures

Service Parameter	Performance Measure
Availability	Percent of ME assets not planned for replacement.
Capacity	Annual cost of ME rentals/leases as a percent of ME total replacement cost.
Quality	Percent of preventative maintenance completed on time.
Reliability	Number of days a ME asset is unavailable due to downtime per year.
Responsiveness	Municipal staff response time to customer inquiries.
Safety	Percent of ME assets with an up to date Standard Operating Procedure (SOP).

Refinement and data collection for performance measures is currently underway to ensure suitability for the July 1, 2025 requirements of Ontario Regulation 588/17. As a result, the current and target performance of each measure has been excluded for machinery and equipment from the 2024 Asset Management Plan.

Please refer to section 9.3.1 and 9.3.2 for the Town's approach to measuring the performance of machinery and equipment assets.

9.4 Lifecycle Strategy

To assemble a lifecycle strategy for machinery and equipment assets, staff reviewed assets in the inventory and updated the planned renewal date and estimated renewal cost for each. Additionally, any assets missing from inventory were added to the lifecycle management plan at that time.

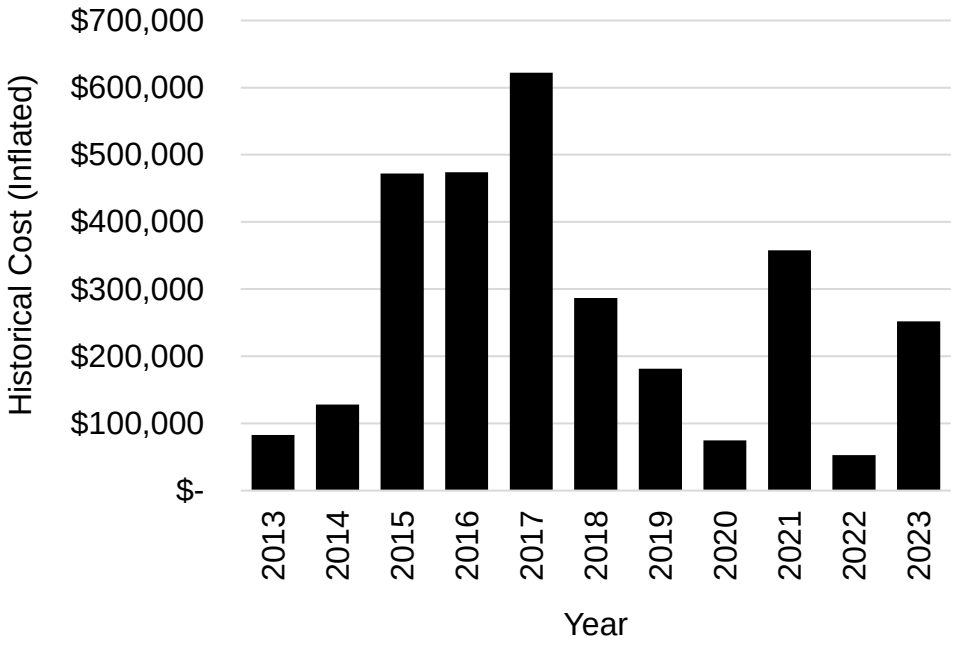
In most cases, the cost to renew each item mirrors data presented in other financial documents, such as the 2024 Annual Budget. However, while reviewing the asset inventory, staff leveraged the opportunity to update renewal costs where applicable based on the most up to date quotes and invoices.

As mentioned in section 9.3.2, the lifecycle management plan outlines what needs to be done throughout the service life for a machinery and equipment asset to maintain the desired level of service.

9.4.1 Recent Investment

To begin, Figure 9-9 showcases recent investment in the category over the last 10 years. The figure only includes acquisitions and renewals as opposed to the full lifecycle costs. Historical costs have been inflated by 2% per year to 2024 to simplify the modeling of financial data.

Figure 9-9: Recent Investment Overview



Reviewing recent investment for the category indicates a total of $2,984,853 in acquisitions or replacements over the last 10 years. Clearly visible are peaks in funding, notably from 2015 to 2017, and in 2021. Over these four years, $1,925,845 was invested in the category for high value items such as compact tractors and associated attachments, generators, and SCADA.

Regular investment for infrastructure and other capital can help to reduce the frequency of peaks in funding by committing a "baseline" amount of funds to be dedicated to renewing assets at or past the end of their useful life. Peaks often repeat themselves when the service life of the assets purchased in the peak ends, which means a similar amount of funds will be required at that time. If those funds cannot be allocated, a reduction to the level of service is at risk. These topics are further discussed in section 9.5.

9.4.2 Acquisition

Acquisitions for machinery and equipment assets were forecasted by consulting planning documents related to future growth and demand. Figure 9-10 highlights upcoming acquisitions in the category.

Figure 9-10: Projected Upcoming Acquisitions

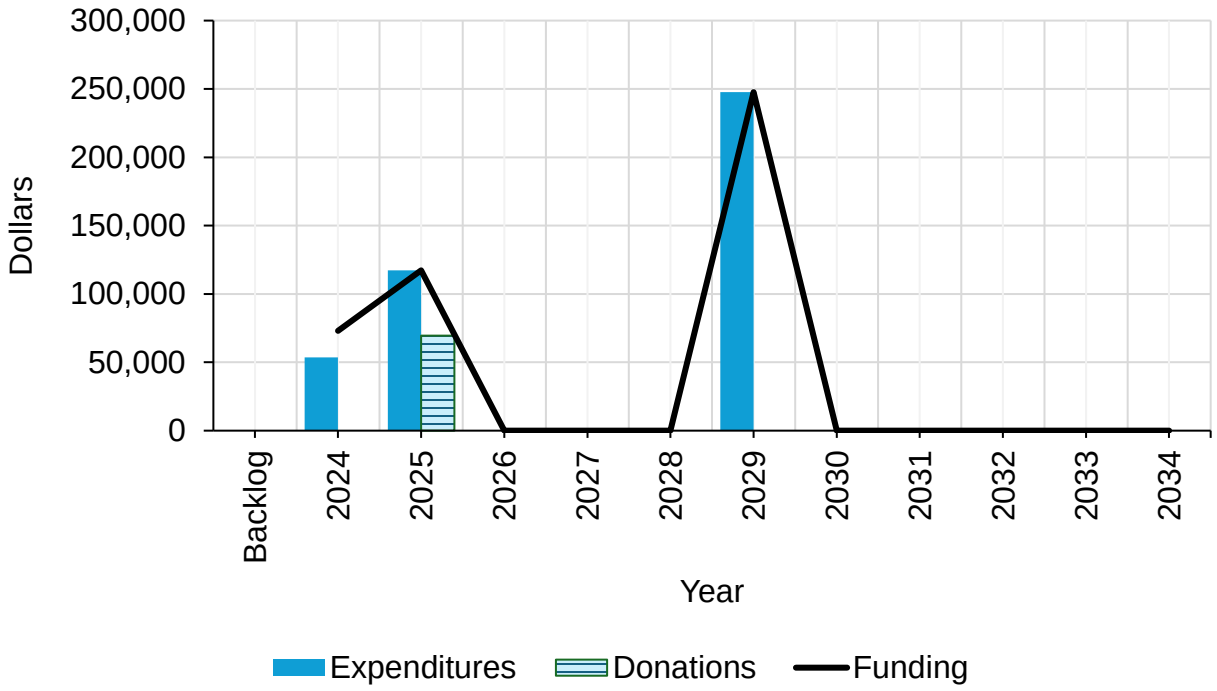
Year	Service Area	Description	Projected Cost
2024	Parks and Recreation	Recreation Trail Vehicle (RTV)	$40,172
2024	Parks and Recreation	Tandem Axle Trailer	$6,457
2024	Water	Diamond Tip Chainsaw	$7,000
2025	Operations	Operations Centre Generator	$117,300
2025	Wastewater	Emerald Crossing Pumping Station Generator	$45,000
2025	Wastewater	Hyland Village Pumping Station Generator	$24,500

On the following page, Figure 9-11 outlines acquisition expenditures while Figure 9-12 displays the acquisition overview chart.

Figure 9-11: Projected Acquisition Expenditures

Planning Period	Year	Projected Expenditures	Projected Donations	Projected Funding	Balance
Backlog	Backlog	$0	$0		$0
Year 0	2024	$53,629	$0	$73,000	$19,371
Year 1	2025	$117,300	$69,500	$117,300	$0
Year 2	2026	$0	$0	$0	$0
Year 3	2027	$0	$0	$0	$0
Year 4	2028	$0	$0	$0	$0
Year 5	2029	$247,644	$0	$247,644	$0
Year 6	2030	$0	$0	$0	$0
Year 7	2031	$0	$0	$0	$0
Year 8	2032	$0	$0	$0	$0
Year 9	2033	$0	$0	$0	$0
Year 10	2034	$0	$0	$0	$0
Total		**$418,573**	**$69,500**	**$437,944**	**$19,371**

Figure 9-12: Acquisition Overview



The acquisition expenditures table indicates all assets as fully funded over the planning period. It is important to recall that donated assets, such as the generators assumed from the Emerald Crossing and Hyland Village subdivisions, do not require funding to be allocated. Outside of donated assets, the peak in 2029 is the result of a planned acquisition of a Trackless compact tractor in the amount of $247,644.

With the exception of a diamond tipped chainsaw planned for purchase in 2024, all non-donated acquisitions are planned to be fully or partially funded by development charges. This is due to the fact each item has been identified as a response to growth from forecasted new development in Town. The only partially development charge-funded acquisition is the projected Operations Centre generator in 2025, which is funded by a combination of development charges and reserves.

Acquisitions must be maintained and replaced, which means an increase in the level of funding for operation and maintenance activities should be expected. Additionally, finances will need to be allocated to replace these new assets at the end of their service life. The lifecycle strategy continues on the following page with the operation and maintenance expenditure tables.

9.4.3 Operation and Maintenance

Outlining operation and maintenance activities consisted of reviewing annual expenditure data with municipal staff to establish a link to the operating expenses found in the 2024 Annual Budget. Below, Figure 9-13 depicts the operations expenditures.

Figure 9-13: Projected Operation Expenditures

Planning Period	Year	Primary Expenditures	Secondary Expenditures	Total Projected Expenditures	Projected Funding	Balance
Year 0	2024	$71,531	$0	$71,531	$71,531	$0
Year 1	2025	$72,962	$0	$72,962	$72,962	$0
Year 2	2026	$74,421	$0	$74,421	$74,421	$0
Year 3	2027	$75,909	$0	$75,909	$75,909	$0
Year 4	2028	$77,427	$0	$77,427	$77,427	$0
Year 5	2029	$78,976	$0	$78,976	$78,976	$0
Year 6	2030	$80,556	$0	$80,556	$80,556	$0
Year 7	2031	$82,167	$0	$82,167	$82,167	$0
Year 8	2032	$83,810	$0	$83,810	$83,810	$0
Year 9	2033	$85,486	$0	$85,486	$85,486	$0
Year 10	2034	$87,196	$0	$87,196	$87,196	$0
Total		**$870,440**	**$0**	**$870,440**	**$870,440**	**$0**

Figure 9-14 displays maintenance expenditures.

Figure 9-14: Projected Maintenance Expenditures

Planning Period	Year	Primary Expenditures	Secondary Expenditures	Total Projected Expenditures	Projected Funding	Balance
Year 0	2024	$110,500	$0	$110,500	$110,500	$0
Year 1	2025	$112,710	$0	$112,710	$112,710	$0
Year 2	2026	$114,964	$0	$114,964	$114,964	$0
Year 3	2027	$117,263	$0	$117,263	$117,263	$0
Year 4	2028	$119,609	$0	$119,609	$119,609	$0
Year 5	2029	$122,001	$0	$122,001	$122,001	$0
Year 6	2030	$124,441	$0	$124,441	$124,441	$0
Year 7	2031	$126,930	$0	$126,930	$126,930	$0
Year 8	2032	$129,468	$0	$129,468	$129,468	$0
Year 9	2033	$132,058	$0	$132,058	$132,058	$0
Year 10	2034	$134,699	$0	$134,699	$134,699	$0
Total		**$1,344,643**	**$0**	**$1,344,643**	**$1,344,643**	**$0**

On the following page, the operation and maintenance overviews are found in Figure 9-15 and 9-16.

Figure 9-15: Operation Overview

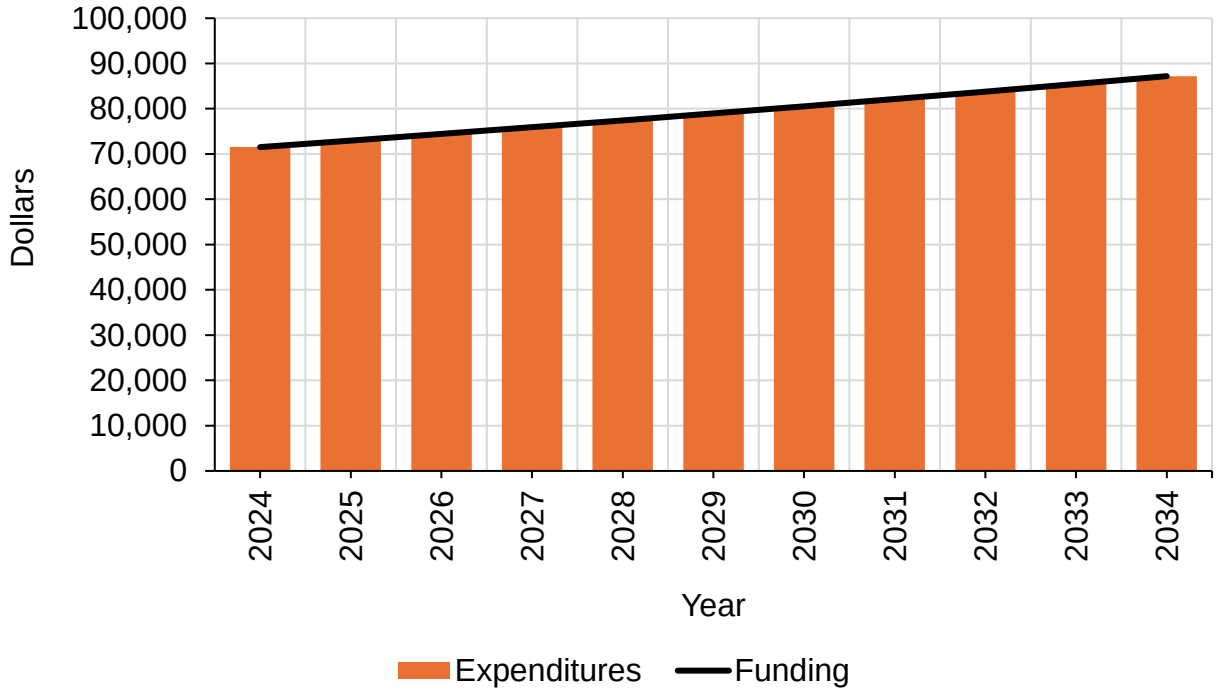
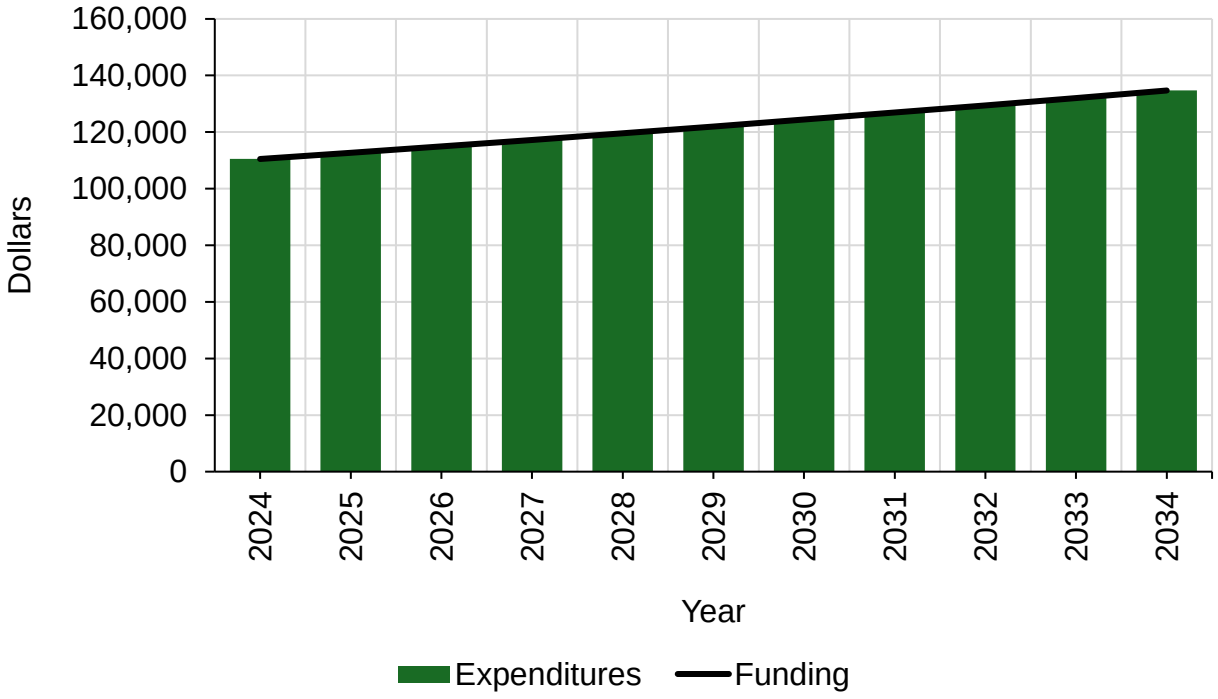


Figure 9-16: Maintenance Overview



Providing greater detail, Figure 9-17 and 9-18 highlight examples of operation and maintenance activities on the following page.

Figure 9-17: Operation Activities

Activity	Interval	Description	Purpose
Generator Inspection and Load Test	Monthly	Generator components are inspected, and a load test is performed.	Maintained performance of equipment.
Generator Servicing and Load Test	Annual	Generator components are serviced, and a load test is performed.	Maintained performance of equipment.
Trailer Safety Inspection	Annual	Commercial trailer inspection.	Compliance with commercial trailer legislation.

Figure 9-18: Maintenance Activities

Activity	Interval	Description	Purpose
Grass Cutting Machinery Preventative Maintenance	As Needed	General preventative maintenance.	Prolonged life of machinery and maintained performance.
Compact Tractor Preventative Maintenance	As Needed	General preventative maintenance.	Prolonged life of machinery and maintained performance.
Heavy-Duty Machinery Preventative Maintenance	As Needed	General preventative maintenance.	Prolonged life of machinery and maintained performance.

An assessment of the operation and maintenance lifecycle activity indicates all years of the planning period to be fully funded. However, the onset of additional machinery and equipment assets beginning in 2024 is likely to increase the required level of funding to meet the demand of a more expansive operation and maintenance program.

Higher costs may be seen in areas such as:

- Fuel and oil
- Insurance
- Maintenance supplies

9.4.4 Replacement

To build a summary of the replacement lifecycle activity, information such as in-service dates and useful life, performance data, and staff feedback was compiled. Below, Figure 9-19 showcases upcoming asset replacements. This list highlights a selection of items and does not reflect all assets to be replacement within each year.

Figure 9-19: Projected Upcoming Replacements

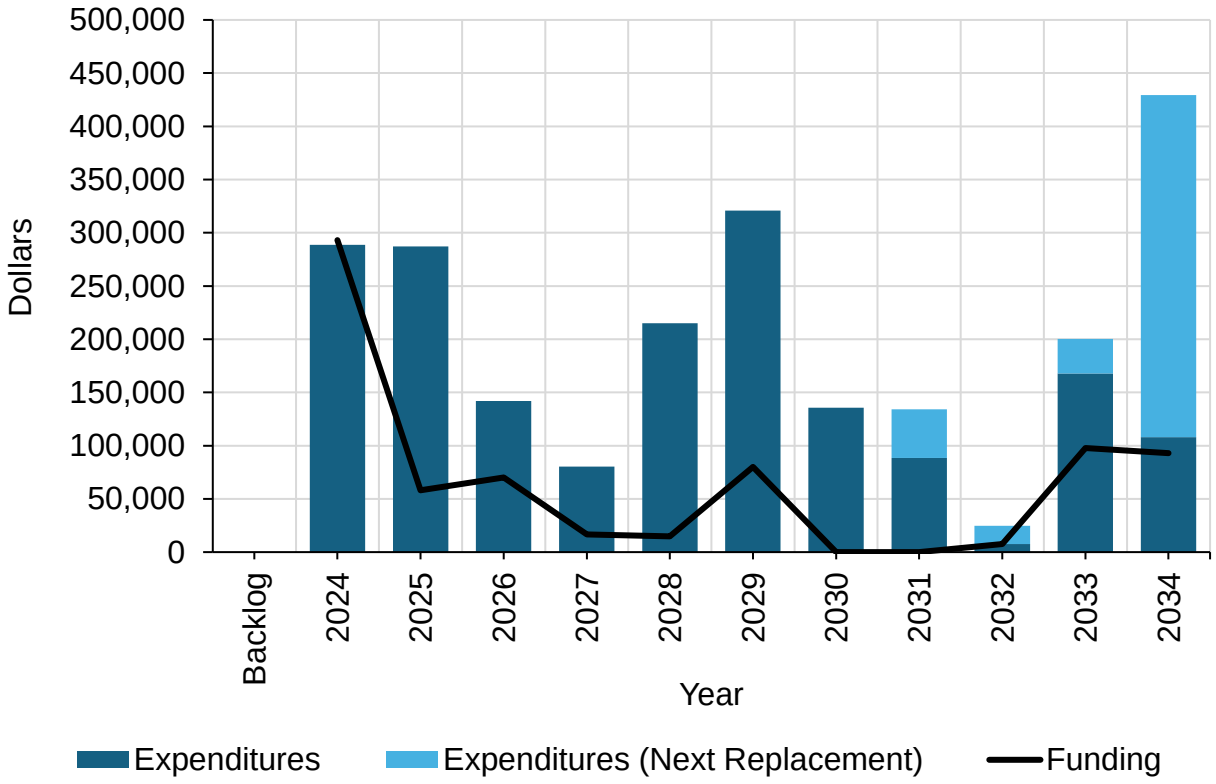
Year	Service Area	Asset ID	Description	Projected Cost
2025	Operations	14424	2006 Trackless MT5T	$190,000
2025	Operations	14437	3-Stage Snowblower	$23,000
2025	Operations	19850	5-Way V Plow	$7,300
2025	Operations	19851	Rear-Mount Hydraulic Sander	$9,000
2025	Wastewater	19742	Sewer Camera	$21,282
2025	Water	22191	Cable and Pipe Locator	$6,750
2026	Cemetery	22217	2004 John Deere 2210	$30,000
2026	Operations	13354	2003 John Deere 4710	$58,000

On the following page, the replacement expenditures and the replacement overview chart is displayed as Figure 9-20 and 9-21.

Figure 9-20: Projected Replacement Expenditures

Planning Period	Year	Projected Expenditures	Projected Funding	Balance
Backlog	Backlog	$0		$0
Year 0	2024	$288,670	$293,100	$4,430
Year 1	2025	$287,332	$58,032	-$229,300
Year 2	2026	$142,000	$70,000	-$72,000
Year 3	2027	$80,259	$16,500	-$63,759
Year 4	2028	$214,936	$14,936	-$200,000
Year 5	2029	$320,952	$80,042	-$240,910
Year 6	2030	$135,817	$0	-$135,817
Year 7	2031	$134,266	$0	-$134,266
Year 8	2032	$24,591	$7,705	-$16,886
Year 9	2033	$200,281	$97,820	-$102,461
Year 10	2034	$429,358	$93,026	-$336,332
Total		**$2,258,462**	**$731,161**	**-$1,527,301**

Figure 9-21: Replacement Overview



Except for 2024, the replacement lifecycle activity indicates a funding shortfall each year, totaling $1,527,301 or $153,173 per year on average. When reviewing data with staff, it was determined that further discussion will be required during the 2025 Annual Budget planning period to develop a strategy to manage the deficit.

Due to many equipment assets utilizing a shorter useful life compared to other capital, they quickly re-appear for replacement a second time during the planning period. This is seen by the quantity of next replacement expenditures visualized in Figure 9-21 from 2031 to 2034. In total, these account for $416,403 (18%) of the replacement forecast.

Overall, a grand total of 68 machinery and equipment asset have been identified for replacement during the 10-year planning period. Of those 68 assets, 62 are expected to be funded by reserves (92%), 3 are expected to be funded by tax rates (4%), and 3 (4%) are awaiting further review. This results in total cost projections to be $1,696,139 from reserves, $54,055 from tax rates, and $508,628 to be determined.

9.4.5 Lifecycle Overview

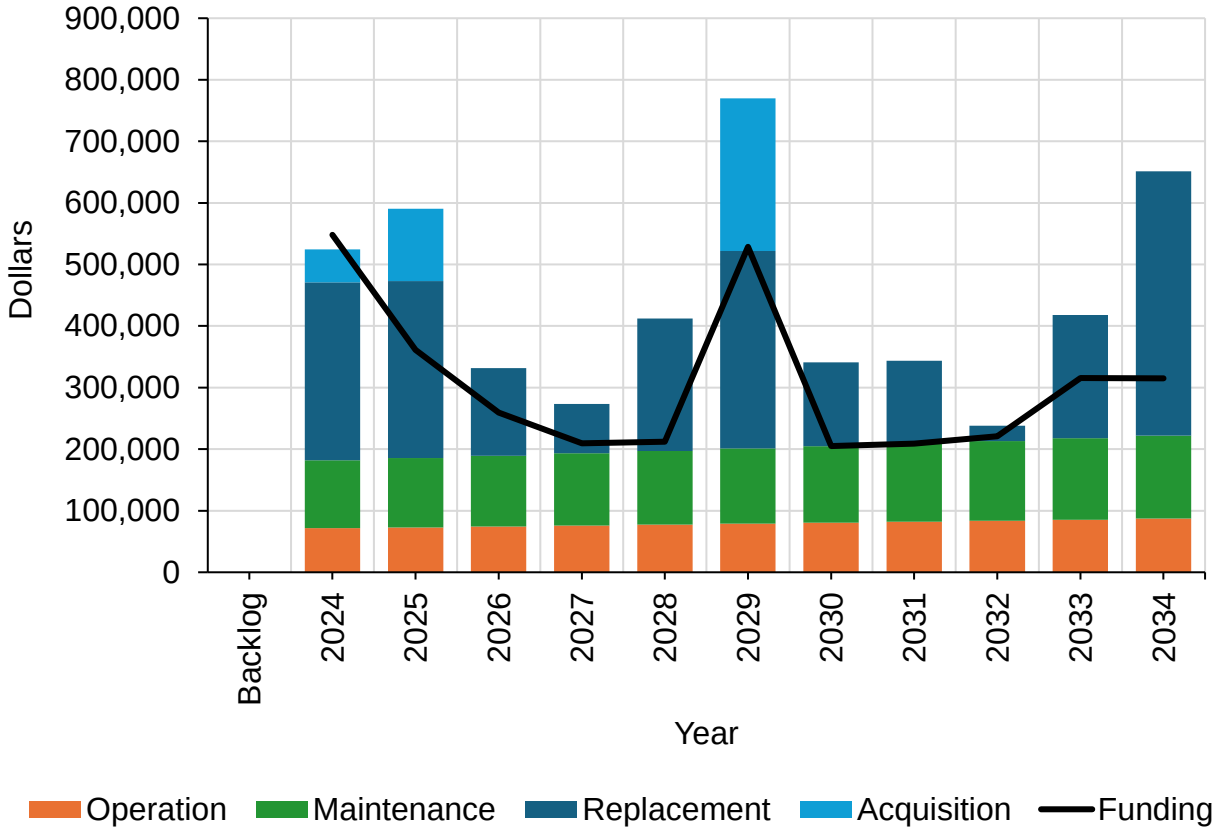
The full lifecycle for machinery and equipment assets is summarized on the following two pages. Beginning with Figure 9-22, expenditures for the machinery and equipment category are outlined.

Figure 9-22: Projected Lifecycle Expenditures

Planning Period	Year	Acquisition	Operation	Maintenance	Replacement	Total Expenditures	Total Funding	Balance
Backlog	Backlog	$0			$0	$0		$0
Year 0	2024	$53,629	$71,531	$110,500	$288,670	$524,330	$548,131	$23,801
Year 1	2025	$117,300	$72,962	$112,710	$287,332	$590,304	$361,004	-$229,300
Year 2	2026	$0	$74,421	$114,964	$142,000	$331,385	$259,385	-$72,000
Year 3	2027	$0	$75,909	$117,263	$80,259	$273,432	$209,673	-$63,759
Year 4	2028	$0	$77,427	$119,609	$214,936	$411,972	$211,972	-$200,000
Year 5	2029	$247,644	$78,976	$122,001	$320,952	$769,573	$528,663	-$240,910
Year 6	2030	$0	$80,556	$124,441	$135,817	$340,814	$204,996	-$135,817
Year 7	2031	$0	$82,167	$126,930	$134,266	$343,362	$209,096	-$134,266
Year 8	2032	$0	$83,810	$129,468	$24,591	$237,869	$220,983	-$16,886
Year 9	2033	$0	$85,486	$132,058	$200,281	$417,825	$315,364	-$102,461
Year 10	2034	$0	$87,196	$134,699	$429,358	$651,252	$314,921	-$336,332
Total		**$418,573**	**$870,440**	**$1,344,643**	**$2,258,462**	**$4,892,118**	**$3,384,188**	**-$1,507,930**

Figure 9-23 showcases the lifecycle overview for machinery and equipment assets on the following page.

Figure 9-23: Lifecycle Overview



Over the 10-year period, the total funding gap for machinery and equipment assets is modelled as $1,507,930. Multiple factors contribute to this gap, such as the high quantity of items needing to be replaced more than once during the planning period due to utilizing a shorter useful life. Additionally, in 2029, a replacement forecast of $320,952 captures several high-cost assets, including a backhoe.

As mentioned in section 9.4.4, staff are planning to continue discussing the funding gap for replacing assets during the preparation period for the 2025 Annual Budget. It is important to remember that the short-term solution of deferring lifecycle activities can result in a reduced level of service. In the context of the replacement lifecycle activity, if machinery and equipment assets are left to age due to insufficient funding, it is likely downtime and decreased performance will become more common. These factors are discussed further in the following section.

9.5 Risk Management

Machinery and equipment assets support multiple service areas to provide a wide range of services for the organization. Understanding the risk associated with managing the category is a key component to short and long-term decision making.

9.5.1 Critical Assets

Assets identified as critical pose the largest impact to services and consequences for the organization in the event of failure. While many machinery and equipment assets are essential, Figure 9-24 suggests critical assets that are likely considered critical.

Figure 9-24: Critical Assets

Service Area	Critical Asset
Administration	Server
Multiple	Generators
Multiple	SCADA
Operations	Trackless Compact Tractors
Operations	Trackless Attachments

9.5.2 Risk Assessment

Section 9.4 showcased the estimated funding gap for the category. To manage the gap, funds will need to be allocated or lifecycle activities will need to be deferred. When considering opportunities to underfund a lifecycle activity for a critical asset, it is vital to be mindful of the potential risk. On the following page, Figure 9-25 displays potential risks.

Figure 9-25: Lifecycle Activities and Potential Risk

Deferred Activity	Potential Risk
Acquisition	▪ Increased likelihood of deficiencies due to overuse ▪ Increased likelihood of safety issues due to overuse ▪ Increased likelihood of operating inefficiencies
Operation and Maintenance	▪ Increased likelihood of unresolved deficiencies ▪ Increased likelihood of reduced performance ▪ Increased likelihood of safety issues due to unresolved deficiencies
Replacement	▪ Increased likelihood of downtime due to age ▪ Increased likelihood of decreased performance due to age ▪ Increased likelihood of higher maintenance costs due to age

9.5.3 Potential Service Impact

Should a critical machinery and equipment asset fail, the service provided by the category will be impacted. Figure 9-26 outlines potential service impacts.

Figure 9-26: Potential Service Impacts

Service Area	Critical Asset	Potential Service Impact
Administration	Server	▪ Unable to access network files. ▪ Likely data loss due to restoring from server backup.
Multiple	Generators	▪ Unable to supply an alternative power source. ▪ Unable to operate related facility.
Multiple	SCADA	▪ Unable to perform remote management of facilities. ▪ Unable to receive automated alerts.
Operations	Trackless Compact Tractors	▪ Unable to perform winter control on sidewalks. ▪ Unable to maintain efficiency of grass cutting operations.
Operations	Trackless Attachments	▪ Unable to perform winter control on sidewalks. ▪ Unable to maintain efficiency of grass cutting operations.

9.5.4 Potential Consequences

In the context of risk, consequences refer to the impact on the organization as a result of the service impacts. Figure 9-27 reviews likely consequences in the event of a critical machinery and equipment asset failure.

Figure 9-27: Potential Consequences

Consequence Type	Likelihood
Environmental	Unlikely
Financial	Likely
Health/Safety	Unlikely
Legal/Compliance	Likely
Operational	Likely
Reputational	Unlikely
Service Delivery	Likely

It is important to recall that the machinery and equipment category supports a wide range of services across several service area, so it is likely that consequences would be significant. Some critical assets are likely to have legislative compliance associated with the service they fulfill. For example, the provision of water and wastewater services, or winter control on sidewalks.

9.5.5 Climate Change

The Town recognizes that factors attributed to climate change have the ability to impact the provision of machinery and equipment services. Figure 9-28 highlights potential climate change factors along with the impact and risk they may introduce to the category.

Figure 9-28: Climate Change Risks

Factor	Potential Impact	Potential Lifecycle Risk
Frequency of Severe Weather	▪ Increased operating frequency of winter control vehicles. ▪ Increased operating frequency of generators.	▪ Higher frequency of renewals due to shorter service life. ▪ Higher maintenance costs due to more rapid wear and tear.
Higher Average Temperatures	▪ Increased operation of interior climate control, where applicable. ▪ Increased risk of overheating.	▪ Higher maintenance costs due to shorter climate control service life. ▪ Higher maintenance costs to resolve overheating issues.
Regulatory and Legislative Changes	▪ Increased refuelling costs. ▪ Increased licensing costs.	▪ Higher operation costs.

Recognizing the risks associated with climate change is an essential element to long-term planning and overall resiliency of the category. Ensuring there is clear understanding of what aspects of machinery and equipment could be impacted by climate change allows for the necessary adjustments in lifecycle activities to be made.

9.6 Recommendations

Overall, the machinery and equipment category is well organized in the asset inventory. Due to the high number of assets, often smaller in value, regular upkeep is important to maintain clear records.

First, continue to split assets into logical components to permit effective modelling of useful life and condition. For example, tractor attachments are often purchased along with a tractor. It is not effective to record this information in the inventory as one asset as this results in the organization losing the ability to maintain separate valuations, condition ratings, and renewal timing for each item.

Second, prioritize asset tagging for machinery and equipment to ensure new items are quickly assigned an asset ID. Many items in the category are one of several identical items, such as Trackless compact tractors or zero turn lawn mowers. To simplify figuring out which item corresponds to which record in the inventory, asset tags should continue to be leveraged. This process will also assist with developing future asset management plans and other financial planning documents.

Section 10 – Stormwater

10.1 Quantity and Replacement Cost

Stormwater assets are organized into six segments, as visualized in Figure 10-1.

Figure 10-1: Quantity and Replacement Cost (2024)

Segment	Inventory Quantity	Estimated Quantity	Inventory Replacement Cost
Catch Basins	719	>1,021 ea	$3,039,546
Discharge Points	18	>61 ea	$184,597
Fittings	28	-	$167,363
Gravity Mains	812	34.9 km	$10,394,690
Maintenance Holes	272	>412 ea	$2,375,265
Network Structures	9	14 ea	$1,226,684
Service Lines	944	>1,136	$1,996,808
Total	**2,802**	**-**	**$19,384,953**

To understand the structure of Figure 10-1, the below provides additional information for select columns.

- *Inventory Quantity* refers to the number of records in the asset inventory.
- *Estimated Quantity* refers to the estimate of real-world quantities, where enabled by available data. The use of greater than implies the quantity is known to be higher, but the quantity listed is based on the best available data at this time.
- *Inventory Replacement Cost* refers to the inventory-based replacement cost.

In terms of assets not in scope, all stormwater infrastructure constructed for the Emerald Crossing and Hyland Village subdivisions has been excluded until each subdivision is assumed by the Town.

The stormwater inventory is largely composed of asset information from older data sources, such as spreadsheets that predate the Town's asset management software. As a result, some of the inventory has missing or inaccurate data such as lengths, diameter, and material of infrastructure. For this reason, replacement cost has been calculated by inflating the historical cost of each asset to 2024.

10.2 Age and Condition

10.2.1 Age

Figure 10-2 highlights the useful life and average age for stormwater assets. The average age is based on the number of years an asset has been in service, while the useful life is an estimate of how many years an asset is expected to remain in service.

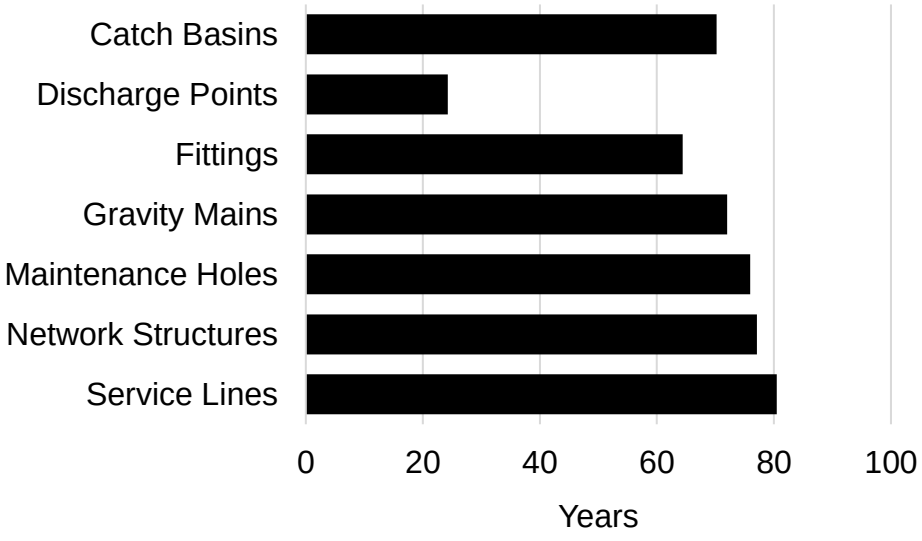
Figure 10-2: Useful Life and Average Age (2024)

Segment	Useful Life	Average Age
Catch Bains	100 Years	30 Years
Discharge Points	50 Years	27 Years
Fittings	50-100 Years	28 Years
Gravity Mains	50-100 Years	28 Years
Maintenance Holes	100 Years	24 Years
Network Structures	100 Years	18 Years
Service Lines	100 Years	20 Years

Variance in the useful life assigned to some segments can be due to factors such as data entry predating the Town's current approach to asset management, or changes in infrastructure materials which are resilient for different lengths of time.

Figure 10-3 below compliments the above table by displaying the average remaining useful life for each segment.

Figure 10-3: Average Remaining Useful Life (2024)



10.2.2 Condition

The Town gains an understanding of the condition of stormwater assets through operation and maintenance activities such as gravity main flushing, CCTV inspections, and retention pond maintenance. These activities are discussed further in section 10.4.

Currently, visual inspection data is not incorporated into the Town's enterprise asset management software. As a result, age-based condition is leveraged for the category.

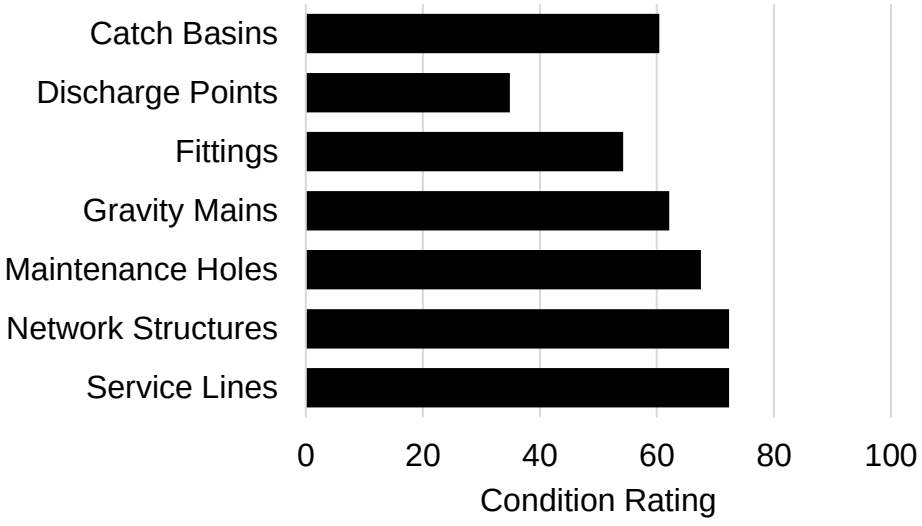
The age-based condition rating scale for stormwater assets is shown below in Figure 10-4.

Figure 10-4: Condition Rating Scale

Condition	Rating
Very Good	80.00 and above
Good	60.00 and above
Fair	40.00 and above
Poor	20.00 and above
Very Poor	0.00 and above

Below, Figure 10-5 showcases the average age-based condition rating for each segment as of the year 2024.

Figure 10-5: Average Age-Based Condition Rating (2024).



While age-based condition ratings are limited in their ability to provide a detailed assessment of asset condition, they still provide insight if the useful life that has been assigned to each asset is accurate.

For example, if a gravity main constructed of PVC has an industry-standard service life of 100 years, it is not inaccurate to suggest that an 75 year-old PVC gravity main may have a reduced condition based on its age.

For this reason, the Town continues to place high importance on ensuring the most suitable useful life is applied to assets, as well as evaluating the remaining service life and updating it as necessary to better represent age-based condition ratings.

10.3 Level of Service

The stormwater collection network is an essential service for communities. Ensuring surface runoff can be safely routed to a nearby watercourse ensures minimized risk of property damage and other factors due to surface water. As a result, it is important to identify the elements of the stormwater network that are priorities for residents.

10.3.1 Level of Service Objectives

Level of service objectives represent the values of customers and are written as qualitative statements. Each objective is linked to a related service parameter which is used to guide the further modeling of level of service.

Figure 10-6 highlights applicable level of service objectives for stormwater.

Figure 10-6: Level of Service Objectives

Service Parameter	Objective Statement
Availability	The stormwater network can meet the needs of the community.
Capacity	The stormwater network can reach all existing and future customers.
Reliability	The stormwater network is maintained to minimize the likelihood of disruption.
Responsiveness	Municipal staff are available for questions and assistance.
Safety	The stormwater network is managed responsibly to prioritize safety and the environment.

10.3.2 Performance Measures

The use of performance measures allows the Town to understand how well an asset category is meeting the appropriate level of service. To ensure connection to the level of service statements established above, each performance measure is linked to the same service parameters.

Refinement and data collection for performance measures is underway to ensure suitability for the July 1, 2025 requirements of Ontario Regulation 588/17. As a result, further discussion surrounding the current and target performance of each measure has been excluded for stormwater assets from the 2024 Asset Management Plan.

Please refer to section 10.3.1, 10.3.2, and 10.3.3 for more information regarding the Town’s approach to measuring the performance of stormwater assets.

Below, Figure 10-7 displays applicable performance measures.

Figure 10-7: Performance Measures

Service Parameter	Metric	Target
Safety	Number of pond overflow or collection main failure events that resulted in downstream flooding or stormwater backups.	0 events
Responsiveness	Municipal staff response time to customer inquiries.	1 business day

10.3.3 Legislated Performance Measures

Ontario Regulation 588/17 outlines specific performance measures for stormwater assets. Please note that legislation uses the terminology “service attribute” in place of “service parameter”. For consistency with other categories in the 2024 Asset Management Plan, “service parameter” will be referenced.

Below, Figure 10-8 highlights technical performance measures.

Figure 10-8: Legislated Technical Performance Measures

Service Parameter	Performance Measure	Performance (2023)
Scope (Capacity)	Percentage of properties in the Municipality resilient to a 100-year storm.	Data not available
Scope (Capacity)	Percentage of the municipal stormwater management system resilient to a 5-year storm.	100%

As the Town’s asset management program continues to progress, many data improvements are achieved. Specialized data, such as the percentage of properties resilient to a 100-year storm, relies upon other data to be in place before the calculation can be made, such as accurate modelling of the entire stormwater collection network. The Town is in the process of refining stormwater data in its GIS database, and is working toward reporting capabilities for this legislated performance measure.

On the following page, Figure 10-9 continues the discussion of legislated level of service with the community performance measures.

Figure 10-9: Legislated Community Performance Measures

Service Parameter	Performance Measure	Level of Service (2021)
Scope (Capacity)	Description, which may include maps, of the user groups or areas of the Municipality that are protected from flooding, including the extent of the protection provided by the municipal stormwater management system.	The Town of Shelburne relies on a variety of infrastructure to manage stormwater across its 6.5 square kilometers of urban and rural landscape. Gravity mains, culverts, and open drains safely guide stormwater to a series of detention ponds and discharge points. These conveyance structures are found throughout the Municipality with urbanized sections utilizing subsurface infrastructure, such as gravity mains, and rural neighbourhoods more frequently relying on surface management techniques, such as culverts and ditches. Working with local Conservation Authorities and its team of urban planners and engineers, the Town ensures design standards are followed when constructing new or replacing existing stormwater infrastructure that protects residents and businesses from flooding during high-volume rainfall and melt events.

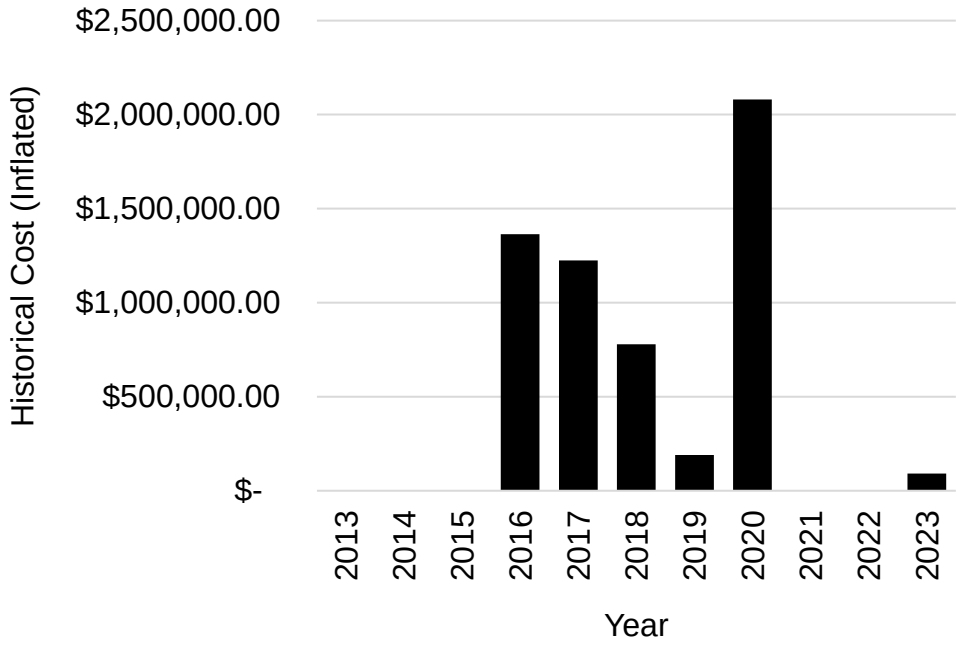
10.4 Lifecycle Strategy

The lifecycle strategy outlines each stage of an asset's lifecycle and the projected level of funding that is required to sustain the current level of service.

10.4.1 Recent Investment

To provide context for the lifecycle strategy, Figure 10-10 showcases recent investment for the stormwater category. The visual only includes acquisition and replacement transactions, with the historical cost of each asset being inflated by 2% per year to 2024 for standardization.

Figure 10-10: Recent Investment Overview



Reviewing the recent investment overview indicates a significant level of value added to the category between 2016 and 2020. This was the result of projects such as:

- Donated acquisition of Greenbrook subdivision phases 1 to 3 in 2016
- Construction of Prentice Dr and Luxton Way in 2017
- Reconstruction of multiple roads in the area of Susan St and Cedar St in 2017
- Donated acquisition of Greenbrook subdivision phase 4 to 8 in 2018
- Donated acquisition of Summerhill subdivision in 2020

Understanding recent levels of investment can provide insight when reviewing budgetary trends associated with the category. As new assets enter service, they will increase the required level of funding to support their lifecycle.

10.4.2 Acquisition

Acquisition activities refer to new assets entering service through purchase, construction, or donation. Assembling the acquisition plan for stormwater was achieved through consultation with staff and other relevant documents, such as the 2024 Adopted Budget.

Figure 10-11 highlights a subset of upcoming acquisitions.

Figure 10-11: Projected Upcoming Acquisitions

Year	Description	Estimated Cost
2025	Emerald Crossing subdivision (part 1 of 2)	$1,653,340
2025	Hyland Village subdivision	$2,928,591
2025	Pine Grove Avenue reconstruction	$780,001
2026	Emerald Crossing subdivision (part 2 of 2)	$614,800

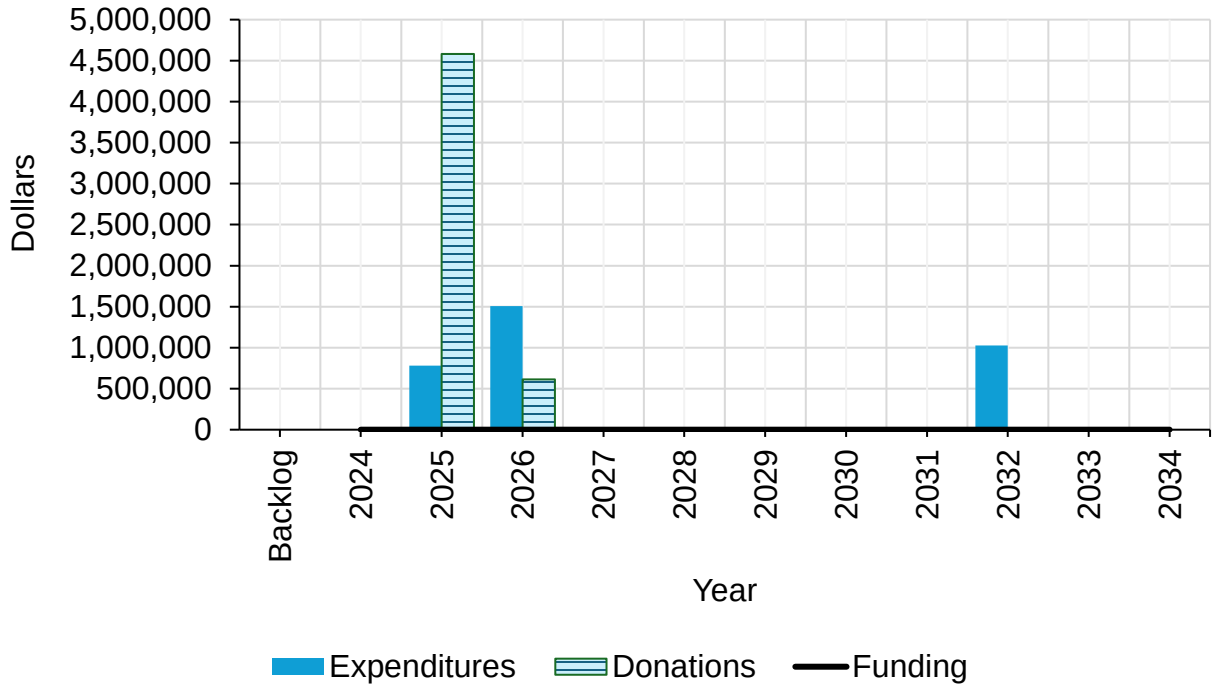
Figure 10-12 outlines projected acquisition expenditures.

Figure 10-12: Projected Acquisition Expenditures

Planning Period	Year	Projected Expenditures	Projected Donations	Projected Funding	Balance
Backlog	Backlog	$0	$0		$0
Year 0	2024	$0	$0	$0	$0
Year 1	2025	$780,001	$4,581,931	$0	-$780,001
Year 2	2026	$1,507,509	$614,800	$0	-$1,507,509
Year 3	2027	$0	$0	$0	$0
Year 4	2028	$0	$0	$0	$0
Year 5	2029	$0	$0	$0	$0
Year 6	2030	$0	$0	$0	$0
Year 7	2031	$0	$0	$0	$0
Year 8	2032	$1,026,249	$0	$0	-$1,026,249
Year 9	2033	$0	$0	$0	$0
Year 10	2034	$0	$0	$0	$0
Total		**$3,313,759**	**$5,196,731**	**$0**	**-$3,313,759**

Below, Figure 10-13 showcases the acquisition overview.

Figure 10-13: Acquisition Overview



Over the planning period, funds have not been allocated to support the acquisition of non-donated assets. As staff begin 2025 Annual Budget discussions in the coming months, opportunities to address financial shortfalls for these projects will be discussed.

As mentioned for other categories, while no funding is required to support the acquisition of donated assets, these assets will require an increased level of investment in the category to support them throughout their lifecycle. Specifically, costs related to operation, maintenance, and replacement.

10.4.3 Operation and Maintenance

The operation and maintenance plan for stormwater assets was assembled through a review of funding allocated in the 2024 Annual Budget. These costs were then linked to the real-world activities undertaken by the organization to support its infrastructure.

Figure 10-14 displays projected operation expenditures.

Figure 10-14: Projected Operation Expenditures

Planning Period	Year	Primary Expenditures	Secondary Expenditures	Total Projected Expenditures	Projected Funding	Balance
Year 0	2024	$27,500	$0	$27,500	$27,500	$0
Year 1	2025	$27,650	$0	$27,650	$27,650	$0
Year 2	2026	$28,203	$0	$28,203	$28,203	$0
Year 3	2027	$28,767	$0	$28,767	$28,767	$0
Year 4	2028	$29,342	$0	$29,342	$29,342	$0
Year 5	2029	$29,929	$0	$29,929	$29,929	$0
Year 6	2030	$30,528	$0	$30,528	$30,528	$0
Year 7	2031	$31,138	$0	$31,138	$31,138	$0
Year 8	2032	$31,761	$0	$31,761	$31,761	$0
Year 9	2033	$32,396	$0	$32,396	$32,396	$0
Year 10	2034	$33,044	$0	$33,044	$33,044	$0
Total		**$330,260**	**$0**	**$330,260**	**$330,260**	**$0**

Below, Figure 10-15 showcases projected maintenance expenditures.

Figure 10-15: Projected Maintenance Expenditures

Planning Period	Year	Primary Expenditures	Secondary Expenditures	Total Projected Expenditures	Projected Funding	Balance
Year 0	2024	$3,500	$100,000	$103,500	$103,500	$0
Year 1	2025	$3,570	$0	$3,570	$3,570	$0
Year 2	2026	$3,641	$0	$3,641	$3,641	$0
Year 3	2027	$3,714	$0	$3,714	$3,714	$0
Year 4	2028	$3,789	$0	$3,789	$3,789	$0
Year 5	2029	$3,864	$0	$3,864	$3,864	$0
Year 6	2030	$3,942	$0	$3,942	$3,942	$0
Year 7	2031	$4,020	$0	$4,020	$4,020	$0
Year 8	2032	$4,101	$0	$4,101	$4,101	$0
Year 9	2033	$4,183	$0	$4,183	$4,183	$0
Year 10	2034	$4,266	$0	$4,266	$4,266	$0
Total		**$42,591**	**$100,000**	**$142,591**	**$142,591**	**$0**

On the following page, the operation and maintenance overview are found in Figure 10-16 and 10-17, respectively.

Figure 10-16: Operation Overview

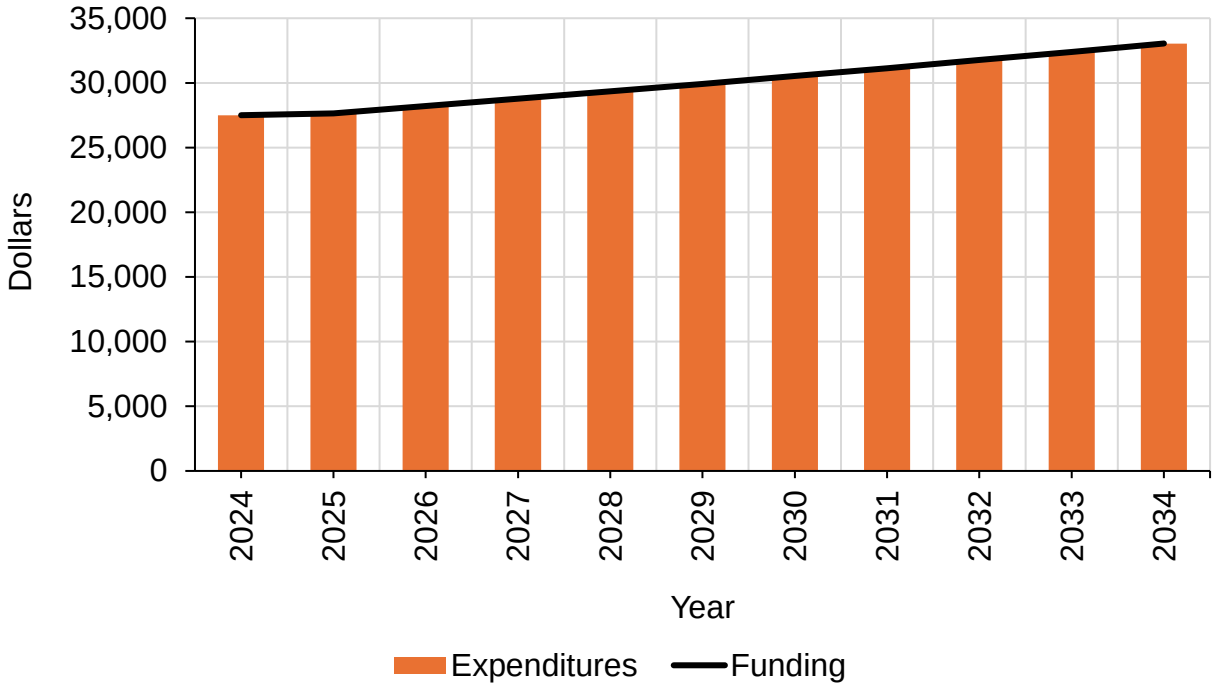
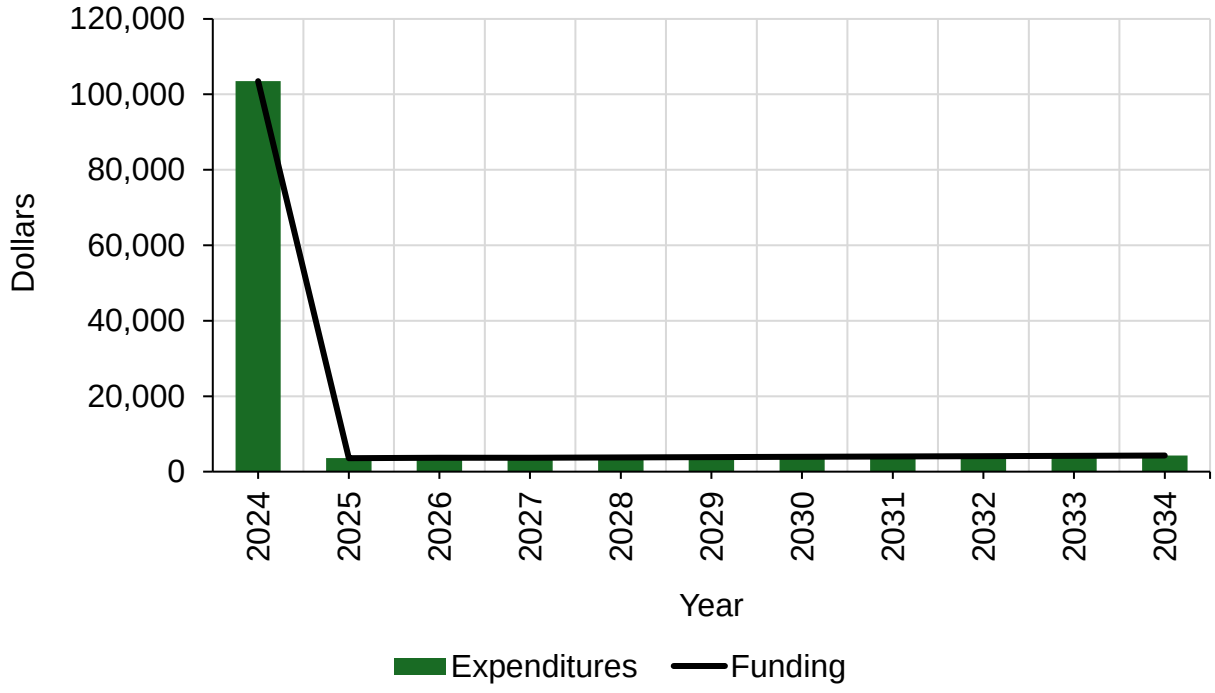


Figure 10-17: Maintenance Overview



An example of the operation and maintenance activities performed on stormwater assets are outlined on the following page as Figure 10-18 and 10-19.

Figure 10-18: Operation Activities

Component	Activity	Interval	Description	Purpose
Gravity Mains	CCTV Inspections	As Needed	Video camera is placed inside mains to check for deficiencies.	Improved awareness of infrastructure condition.

Figure 10-19: Maintenance Activities

Component	Activity	Interval	Description	Purpose
Catch Basins	Debris Removal	Annually	Debris is vacuumed from catch basin structures.	Improved conveyance of stormwater.
Catch Basins	Moduloc Maintenance	As Needed	Re-parging or replacement of catch basin moduloc.	Prolonged life of infrastructure.
Gravity Mains	Flushing	Annually	Water is flushed through the gravity main, and debris removed.	Improved conveyance of stormwater.
Headwalls	Debris Removal	Monthly	Debris settled at headwall outlet is removed.	Improved conveyance of stormwater.
Open Drains	Debris Removal	As Needed	Debris is removed from open drains.	Improved conveyance of stormwater.
Open Drains	Re-Grading	Annually	Open drain systems are regraded to ensure proper runoff and conveyance.	Improved conveyance of stormwater.
Retention Ponds	Grounds Maintenance	As Needed	Grass is trimmed and debris is collected.	Maintained cleanliness of retention ponds.

Reviewing the projected operation and maintenance expenditures indicates fully funded activities over the planning period. The only non-recurring expense (secondary expenditure) is in the maintenance category. This is the Besley Drain Cleanout project forecasted to occur in 2024 for an estimated $100,000.

As discussed in section 10.4.2, the acquisition of new assets will increase the level of funding required to support the increased demand for operation and maintenance tasks. The most substantial will be the assumption of extensive stormwater infrastructure built as part of the Hyland Villag and Emerald Crossing subdivisions, including three new retention ponds. Higher expenditures are most likely to be seen in:

- Labour
- Maintenance Materials
- Professional services
- Structure Maintenance

By recognizing these future costs, strategic long-term operational and financial planning can be structured appropriately to ensure the desired level of service continues to be met.

10.4.4 Replacement

To outline the replacement needs for stormwater, staff turned to reviewing assets in the inventory to evaluate whether it was likely that the age-based replacement date was reasonable. This was due to the fact that, to staff's knowledge and limited by available condition inspection data, there is not currently any infrastructure in an obvious state of requiring replacement.

Below, Figure 10-20 outlines some short-term infrastructure replacement needs based solely on the age of each asset.

Figure 10-20: Projected Upcoming Replacements

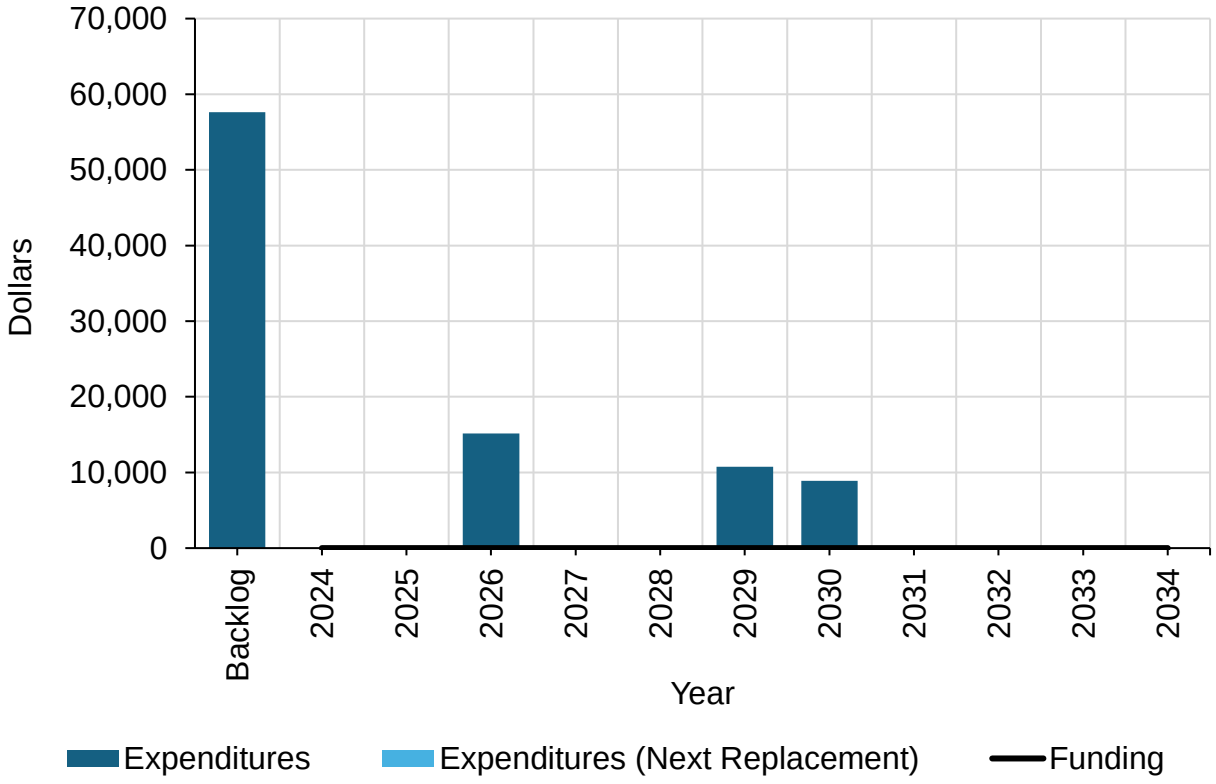
Year	Asset ID	Description	Projected Cost
Backlog	17207	Gravity Main near Jelly St N at Veterans Lane	$2,727
Backlog	17221	Gravity Main near James St N at Veterans Lane	$27,412
Backlog	17322	Gravity Main west of Jelly St N at Veterans Lane	$15,740
2026	16923	Gravity Main at 426 First Ave E	$15,156

On the following page, Figure 10-21 highlights projected replacement expenditures and Figure 10-22 showcases the replacement overview.

Figure 10-21: Projected Replacement Expenditures

Planning Period	Year	Projected Expenditures	Projected Funding	Balance
Backlog	Backlog	$57,612		-$57,612
Year 0	2024	$0	$0	$0
Year 1	2025	0	$0	$0
Year 2	2026	$15,156	$0	-$15,156
Year 3	2027	$0	$0	$0
Year 4	2028	$0	$0	$0
Year 5	2029	$10,760	$0	-$10,760
Year 6	2030	$8,907	$0	-$8,907
Year 7	2031	$0	$0	$0
Year 8	2032	$0	$0	$0
Year 9	2033	$0	$0	$0
Year 10	2034	$0	$0	$0
Total		**$92,435**	**$0**	**-$92,435**

Figure 10-22: Replacement Overview



Reviewing the projected replacement activities for stormwater indicates a low amount of required funding when compared to other categories. As mentioned, the forecasted replacements are modeled based solely on their age, these assets have not been formally scheduled for replacement by staff.

To improve the usefulness of the replacement strategy, it is encouraged that the Town conduct visual inspections on the infrastructure indicated as aging and either schedule a replacement date or update the useful life as needed.

10.4.5 Lifecycle Overview

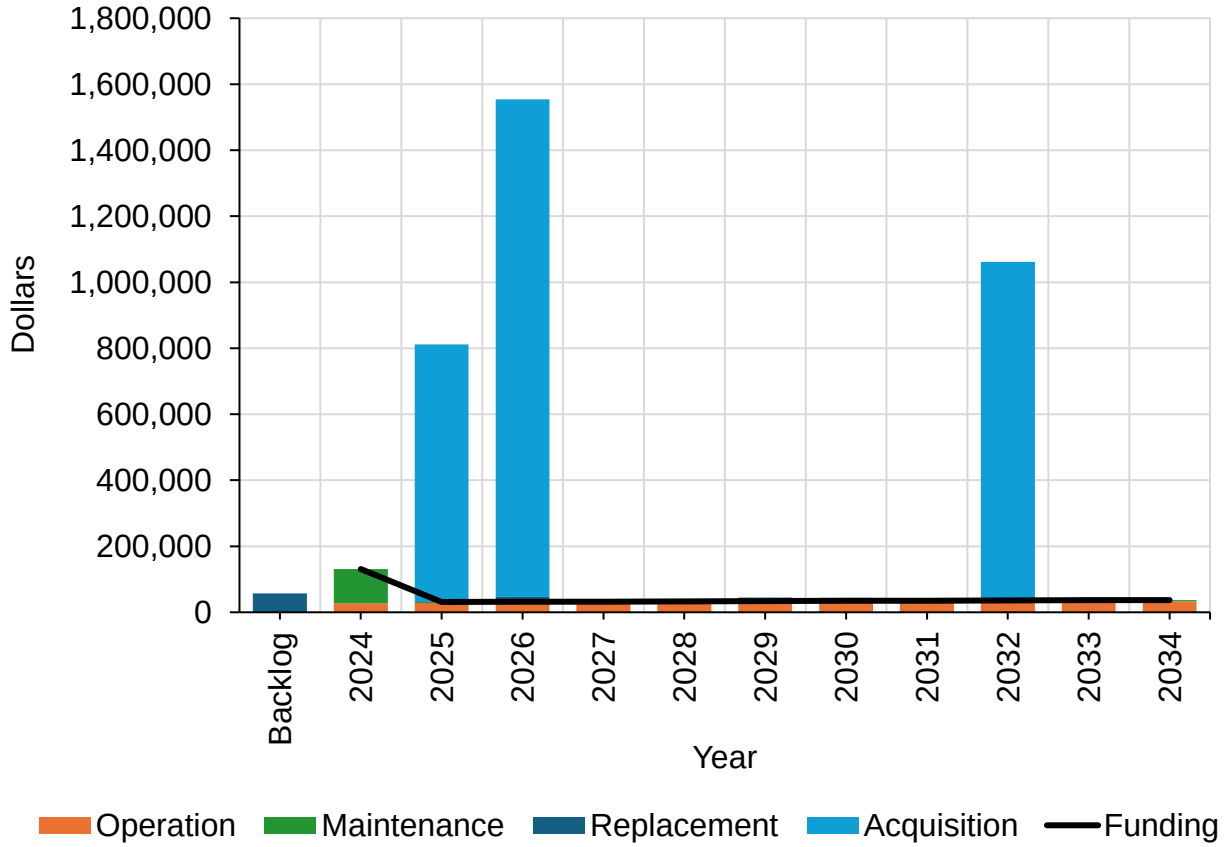
To assemble all elements of the lifecycle strategy, Figure 10-23 outlines projected expenditures.

Figure 10-23: Projected Lifecycle Expenditures

Planning Period	Year	Acquisition	Operation	Maintenance	Replacement	Total Expenditures	Total Funding	Balance
Backlog	Backlog	$0			$57,612	$57,612		-$57,612
Year 0	2024	$0	$27,500	$103,500	$0	$131,000	$131,000	$0
Year 1	2025	$780,001	$27,650	$3,570	$0	$811,221	$31,220	-$780,001
Year 2	2026	$1,507,509	$28,203	$3,641	$15,156	$1,554,509	$31,844	-$1,522,665
Year 3	2027	$0	$28,767	$3,714	$0	$32,481	$32,481	$0
Year 4	2028	$0	$29,342	$3,789	$0	$33,131	$33,131	$0
Year 5	2029	$0	$29,929	$3,864	$10,760	$44,554	$33,794	-$10,760
Year 6	2030	$0	$30,528	$3,942	$8,907	$43,376	$34,469	-$8,907
Year 7	2031	$0	$31,138	$4,020	$0	$35,159	$35,159	$0
Year 8	2032	$1,026,249	$31,761	$4,101	$0	$1,062,111	$35,862	-$1,026,249
Year 9	2033	$0	$32,396	$4,183	$0	$36,579	$36,579	$0
Year 10	2034	$0	$33,044	$4,266	$0	$37,311	$37,311	$0
Total		**$3,313,759**	**$330,260**	**$142,591**	**$92,435**	**$3,879,044**	**$472,850**	**-$3,406,194**

On the following page, the lifecycle overview is found as Figure 10-24.

Figure 10-24: Lifecycle Overview



Overall, the lifecycle strategy for stormwater is projected to end with a funding gap of $3,406,194. Over 97% of the shortfall is due to planned acquisitions which are estimated to cost the Town in excess of $3,300,000 over the planning period.

10.5 Risk Management

Stormwater collection assets are key infrastructure to ensure the safe conveyance and management of ground surface water. Failure for the category has the potential to result in extensive damage to private and municipal property, as well as introduce other factors.

10.5.1 Critical Assets

Critical assets carry the highest impacts to service and consequences for the organization in the event of failure. Identifying which assets in the category are critical is the first step to managing risk.

Figure 10-25 suggests critical assets for stormwater.

Figure 10-25: Critical Assets

Segment	Critical Asset
Gravity Mains	Trunk Mains
Network Structures	Detention/Retention Facilities

10.5.2 Risk Assessment

Maintaining asset performance is a key step to minimizing risk, which is accomplished through strategic lifecycle management. Below, Figure 10-26 showcases the relationship between deferring a lifecycle activity and the potential risk.

Figure 10-26: Lifecycle Activities and Potential Risk

Deferred Activity	Potential Risk
Acquisition	▪ Increased likelihood of capacity issues at detention and retention facilities ▪ Increased likelihood of higher maintenance costs due to increased erosion ▪ Increased likelihood of development challenges due to capacity issues
Operation and Maintenance	▪ Increased likelihood of frequent deficiencies ▪ Increased likelihood of reduced performance ▪ Increased likelihood of legal non-compliance
Replacement	▪ Increased likelihood of capacity issues at detention and retention facilities ▪ Increased likelihood of decreased performance due to age ▪ Increased likelihood of frequent deficiencies due to age ▪ Increased likelihood of higher maintenance costs due to age ▪ Increased likelihood of higher replacement costs due to age

10.5.3 Potential Service Impact

In the event a critical stormwater asset failed, it is important to consider the potential impacts to service. Figure 10-27 suggests possible service impacts.

Figure 10-27: Potential Service Impacts

Segment	Critical Asset	Potential Service Impact
Gravity Main	Trunk Mains	▪ Unable to convey stormwater from lower-tier collection mains to discharge points or detention/retention facilities ▪ Lower-tier collection mains unable to handle volume of stormwater, potential upstream backups. ▪ Extensive flooding at inlets on streets and property due to loss of conveyance, resulting in restricted road access and private property or other infrastructure damage. ▪ Risk of safety issues due to depth of pooling water.
Network Structures	Detention/ Retention Facilities	▪ Unable to manage incoming volume of stormwater from gravity mains. ▪ Significant flooding in the immediate area surrounding detention/retention facilities. ▪ Increased rate of erosion on pond banks and downstream. ▪ Damage to private property, infrastructure, and landscape downstream of facility due to volume of stormwater flow. ▪ Risk of safety issues due to depth of pooling water.

10.5.4 Potential Consequences

In addition to impacts to service, the organization is likely to experience consequences as a result of critical asset failure. Figure 10-28 highlights potential consequences.

Figure 10-28: Potential Consequences

Consequence Type	Likelihood
Environmental	Unlikely
Financial	Likely
Health/Safety	Unlikely
Legal/Compliance	Likely
Operational	Likely
Reputational	Likely
Service Delivery	Likely

While only an estimate of the possible consequences, there is significant regulation surrounding the management of stormwater as well as that of the other infrastructure that would be impacted. For this reason, critical and extensive stormwater asset failure has the potential to result in severe consequences.

10.5.5 Climate Change

Climate change is directly related to the management of stormwater. Weather patterns and other environmental events have the potential to impact the design, maintenance, and risk associated with stormwater assets.

Below, Figure 10-29 discusses potential climate change factors as they relate to the category.

Figure 10-29: Climate Change Risks

Factor	Potential Impact	Potential Lifecycle Risk
Frequency of Severe Weather	▪ Increase frequency of high rainfall events resulting in greater stormwater volumes. ▪ Increased risk of damage to surface assets, particularly those susceptible to erosion.	▪ Higher acquisition and replacement costs for higher capacity infrastructure. ▪ Higher maintenance costs due to increased frequency of surface repairs.
Regulatory and Legislative Changes	▪ Increased regulation surrounding discharge into local watercourses. ▪ Increased regulation surrounding minimum design resiliency standards.	▪ Higher acquisition and replacement costs to construct compliant assets or upgrade existing infrastructure. ▪ Higher operating costs for increased monitoring and reporting standards.
Seasonal Weather Variance	▪ Reduced predictability of seasonal weather changes. ▪ Increased risk of pooling water at inlets covered by snow/ice. ▪ Increased frequency of freeze/thaw cycles, limiting the ability for ground to absorb surface water due to frost.	▪ Higher maintenance costs for increased frequency of surface repairs. ▪ Higher acquisition costs for more extensive subsurface infrastructure.

10.6 Recommendations

The stormwater inventory, while reasonably comprehensive, does present some shortfalls. Three items are recommended to advance the state of the category.

First, continue to pursue linking assets to the Town's GIS database. This will allow staff to fully utilize asset data in the inventory by knowing where each record is located. Completing this step will open opportunities for further developments to the category such as collecting more detailed secondary data and factoring in visual condition assessment data.

Second, continue to improve the availability of stormwater data in the Town's GIS database to enable the analysis of rainfall events, such as the legislative requirement of defining resiliency to a 100-year storm. Complete stormwater data will also enable the Town to easily estimate where additional infrastructure may be required.

Third, develop a strategy to translate visual condition assessment data into a format that can be integrated into the Town's enterprise asset management software to enable accurate modeling of the category's condition.

Section 11 – Transportation

Section 11 encompasses the following asset categories:

- Roads
- Sidewalks
- Signs
- Streetlights
- Traffic Lights

These categories have been grouped due to the close relation to one another.

11.1 Quantity and Replacement Cost

Quantity and replacement cost of assets within each category are found in Figure 11-1.

Figure 11-1: Quantity and Replacement Cost (2024)

Category	Segment	Inventory Quantity	Estimated Quantity	Inventory Replacement Cost	Estimated Replacement Cost
Roads	Asphalt Road Base	202	34.9 km	$13,168,402	$14,141,994
	Asphalt Road Surface	258	34.9 km	$11,359,806	$9,295,320
	Gravel Road	17	3.8 km	$680,201	$680,201
Subtotal		**477**	**38.7 km**	**$25,208,409**	**$24,117,515**
Sidewalks	-	192	31.5 km	$6,397,340	$9,072,000
Signs	Destination Signs	2	2 ea	$74,792	$74,792
Streetlights	-	33	840 ea	$788,008	$4,387,664
Traffic Lights	-	3	3 ea	$636,280	$1,800,000
Grand Total		**707**	**-**	**$33,104,829**	**$38,851,971**

To interpret Figure 11-1 most effectively, the below provides additional information for select columns.

- *Inventory Quantity* refers to the number of records in the asset inventory.
- *Estimated Quantity* refers to the estimate of real-world quantities.
- *Inventory Replacement Cost* refers to the inventory-based replacement cost.
- *Estimated Replacement Cost* utilizes unit costs based on the estimated quantity.
- Road estimated quantity refers to road length as opposed to lane length.

In terms of assets in scope, it should be noted that the Hyland Village and Emerald Crossing unassumed subdivisions have been excluded from quantity and replacement cost tables for all asset categories.

In calculating replacement cost, the below assumptions were made in the absence of reliable attribute data:

- Road lane width is assumed to be 4 meters
- Sidewalk width is assumed to be 1.5 meters
- Cost of concrete curb and gutter is excluded
- Streetlights are concrete post and cobra head light

Overall, the inventory requires significant attention to match the real-world quantities of transportation asset categories to more effectively model replacement cost.

11.2 Age and Condition

11.2.1 Age

Transportation assets have unique useful life durations based on construction material and use. Figure 11-2 outlines the useful life and average age of each.

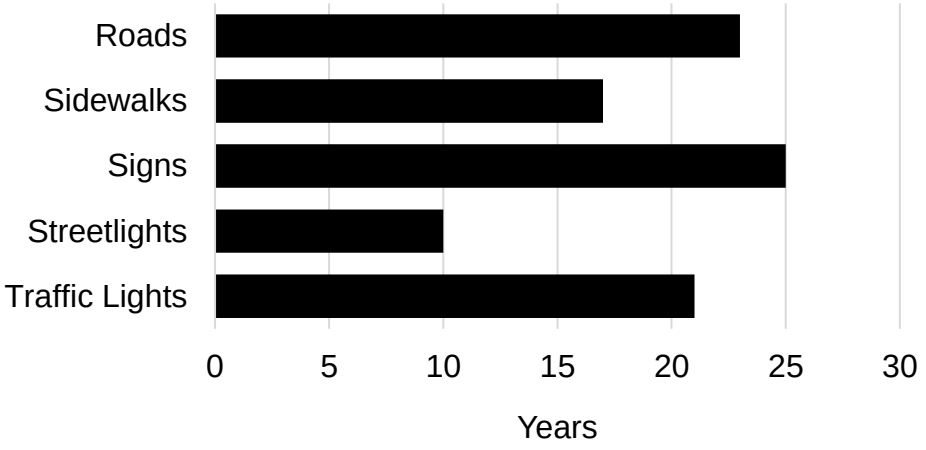
Figure 11-2: Useful Life and Average Age (2024)

Category	Segment	Useful Life	Average Age
Roads	Asphalt Base	50 Years	35 Years
	Asphalt Surface	25 Years	20 Years
	Gravel Road	50 Years	93 Years
Sidewalks	-	30 Years	28 Years
Signs	Destination Signs	15-50 Years	8 Years
Streetlights	-	25 Years	22 Years
Traffic Lights	-	25 Years	4 Years

It is important to be mindful of asset categories with low quantities when reviewing calculations such as average age. Expanding on age, Figure 11-3 highlights the average remaining useful life for transportation assets.

Figure 11-3 is found on the following page.

Figure 11-3: Average Remaining Useful Life (2024)



11.2.2 Condition

For asset management, condition data for transportation assets is typically structured as having visual condition inspection data for road assets and relying on age-based condition assessments for other categories. However, visual inspections of the road network are documented in the form of a Roads Needs Study, which is conducted every five years. The next Roads Needs Study arrives in 2025 at which point visual condition assessment data will be re-added to the asset inventory. Until 2025, age-based condition data will be referenced for all transportation assets.

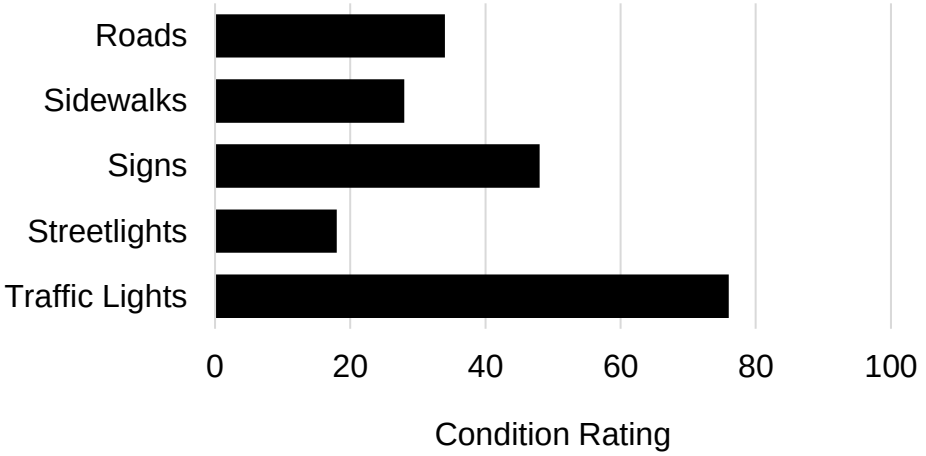
Figure 11-4 displays the age-based condition rating scale.

Figure 11-4: Condition Rating Scale

Condition	Rating
Very Good	80.00 and above
Good	60.00 and above
Fair	40.00 and above
Poor	20.00 and above
Very Poor	0.00 and above

On the following page, the average age-based condition rating for transportation assets is presented as Figure 11-5.

Figure 11-5: Average Age-Based Condition Rating (2024)



Age-based condition ratings, while high level and assumption-based, still provide important insight for the transportation category. Road and sidewalk assets do not have extensive preventative maintenance programs to help manage their condition prior to renewal, meaning age is a defining factor to deterioration.

11.3 Level of Service

Together, transportation assets deliver a core service for residents and the organization. Additionally, they play a vital role in supporting neighbouring communities and regional transportation networks.

11.3.1 Level of Service Objectives

To understand the priorities of customers, level of service objectives are utilized to describe what the elements of the service that are likely to be most valued. Figure 11-6 discusses applicable level of service objectives for transportation.

Figure 11-6: Level of Service Objectives

Service Parameter	Objective Statement
Capacity	The connectivity and distribution of the transportation network is logical.
Quality	The transportation network provides a smooth and comfortable surface.
Reliability	The transportation network is maintained to reduce the likelihood of disruption.
Responsiveness	Municipal staff are available for questions and assistance.
Safety	The transportation network prioritizes the safety of users.

11.3.2 Performance Measures

To connect level of service objectives to measurable data, performance measures are used to define how each service parameter will be quantified. Due to the extensive legislation guiding the management of assets in the transportation category, performance measures are structured to ensure alignment with legislation.

Refinement and data collection for performance measures is currently underway to ensure suitability for the July 1, 2025 requirements of Ontario Regulation 588/17. As a result, further discussion surrounding the current and target performance of each measure has been excluded for transportation assets from the 2024 Asset Management Plan.

Please refer to section 11.3.1 and 11.3.2 for more information regarding the Town's approach to measuring the performance of transportation assets.

On the following page, Figure 11-7 outlines applicable performance measures.

Figure 11-7: Performance Measures

Service Parameter	Performance Measure	Target
Reliability	Roads are patrolled within the parameters defined by the Ontario Minimum Maintenance Standards.	100% compliance
Responsiveness	Municipal staff response time to customer inquiries.	1 business day
Safety	Snow and ice accumulation on roads is identified and addressed within the parameters defined by the Ontario Minimum Maintenance Standards.	100% compliance
Safety	Road surface deficiencies are identified and resolved within the parameters defined by the Ontario Minimum Maintenance Standards.	100% compliance
Safety	Sidewalk surface deficiencies are identified and resolved repaired within the parameters defined by the Ontario Minimum Maintenance Standards.	100% compliance
Safety	Snow and ice accumulation on sidewalks is identified and addressed within the parameters defined by the Ontario Minimum Maintenance Standards.	100% compliance
Safety	Luminary deficiencies are identified and resolved within the parameters defined by the Ontario Minimum Maintenance Standards.	100% compliance
Safety	Sign deficiencies are identified and resolved within the parameters defined by the Ontario Minimum Maintenance Standards.	100% compliance
Safety	Traffic control signal system deficiencies are identified and resolved within the parameters defined by the Ontario Minimum Maintenance Standards.	100% compliance
Safety	Road and pavement marking deficiencies are identified and resolved within the parameters defined by the Ontario Minimum Maintenance Standards.	100% compliance

11.3.3 Legislated Performance Measures

Ontario Regulation 588/17 outlines specific performance measures for road assets. Please note that legislation uses the terminology “service attribute” in place of “service parameter”. For consistency with other categories in the 2024 Asset Management Plan, “service parameter” will be substituted for “service attribute”.

Legislative level of service data begins as Figure 11-8 below.

Figure 11-8: Legislated Technical Performance Measures

Service Parameter	Performance Measure	Performance (2020, 2024)
Quality	For paved roads in the Municipality, the average pavement condition index value.	76.00
Quality	For unpaved roads in the Municipality, the average surface condition.	Very Good
Scope (Capacity)	Number of lane-kilometers of arterial roads as a proportion of square kilometers of land area of the Municipality.	1.02
Scope (Capacity)	Number of lane-kilometers of collector roads as a proportion of square kilometers of land area of the Municipality.	1.96
Scope (Capacity)	Number of lane-kilometers of local roads as a proportion of square kilometers of land area of the Municipality.	7.51

Some values for the scope service parameter in Figure 11-8 differ from those presented in the 2022 Asset Management Plan despite the Town not assuming or constructing any new roads. This is due to the Town continuously refining data in its GIS database, which has resulted in minor adjustments to the geometry of line segments, impacting the calculated length.

For the level of service reported for the quality service parameter, this data stems from the Town’s Roads Needs Study which is conducted every five years. The most recent Roads Needs Study was assembled in 2020, with the next scheduled for 2025. For this reason, the level of service reported for the quality service parameter mirrors that presented in the 2020 Asset Management Plan.

Legislated level of service continues on the following page as Figure 11-9.

Figure 11-9: Legislated Community Performance Measures

Service Parameter	Performance Measure	Current Performance
Scope (Capacity)	Description, which may include maps, of the road network in the Municipality and its level of connectivity.	The Town of Shelburne provides 45 kilometers of roadways (89 lane kilometers) spanning 117 unique streets and laneways. The network primarily consists of asphalt surface with gravel laneways accounting for less than 8% of total system length. Two Provincial Highways and two County Roads offer connectivity for residents and businesses to neighbouring communities, as well as other major road transportation networks.
Quality	Description or images that illustrate the different levels of road class pavement condition.	Photographs found in Figures 11-10 to 11-13 on the following page showcase an asphalt road surface with various condition ratings. The photos were extracted from the 2020 update to the 2016 Roads and Sidewalks Needs Study, completed by S. Burnett & Associates Limited in July 2020.

It should be noted that the values presented in the scope service parameter of Figure 11-9 are inclusive of all roads within the Town of Shelburne municipal boundary regardless of road class and ownership. Park interior roads, service roads, and roads supporting parking areas are excluded.

Figure 11-10: Poor Condition (PCR < 60)

Figure 11-11: Fair Condition (PCR 60 - 70)

Figure 11-12: Good Condition (PCR 70 - 85)

Figure 11-13: Very Good Condition (PCR > 85)

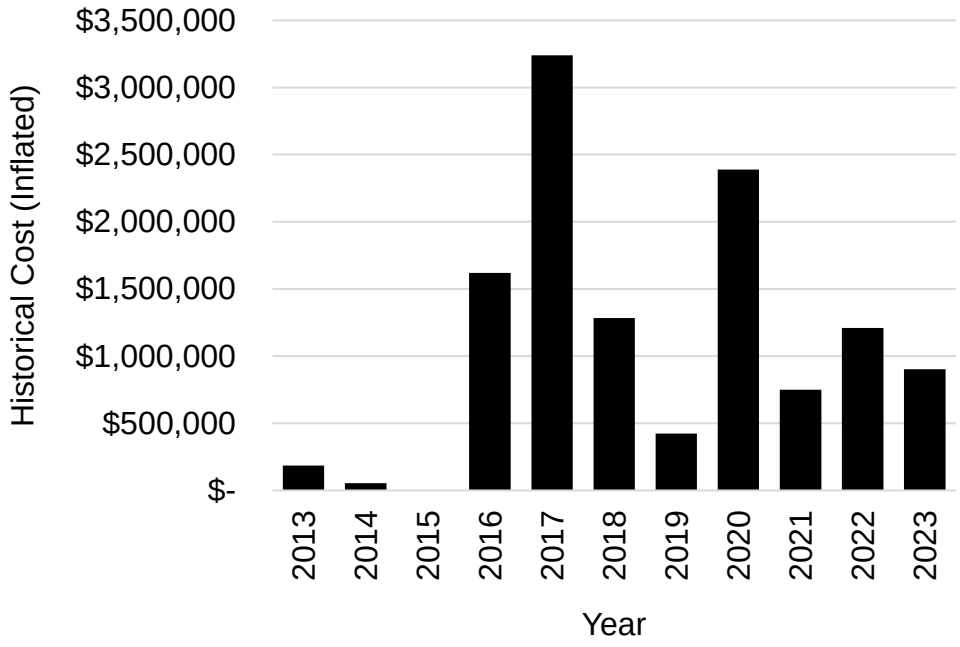
11.4 Lifecycle Strategy

The lifecycle strategy details the Town's approach to managing transportation assets throughout their service life. The strategy details the level of investment projected for each lifecycle activity in order to maintain the current level of service.

11.4.1 Recent Investment

To begin, Figure 11-14 highlights recent investment for the transportation category. The chat only considers acquisition and replacement activities over the past 10 years. To standardize cost, the historical cost of each asset has been inflated by 2% per year to the year 2024.

Figure 11-14: Recent Investment Overview



Peaks of acquisition and replacement in 2016 and 2017 are largely due to the Town's assumption of select phases of the Greenbrook subdivision, with other projects such as the reconstruction of Ann St, Cedar St, Muriel St, and Willow St also contributing. Over these two years, a total of $4,858,426 in value was added to the category. In 2020, the Town assumed the Summerhill subdivision, adding roughly $2,200,000 in value across road, sidewalk, and sign assets.

It is important to remember that periods of high-quality acquisitions, such as the assumption of subdivisions, brings into the asset inventory a multitude of assets all in similar condition and with a similar useful life. This has the potential to result in peaks of replacement needs long-term.

11.4.2 Acquisition

For transportation assets, staff review long-term financial and development documents to estimate the potential assumption year for new subdivisions and whether any new roads are planned for construction. Figure 11-15 showcases upcoming acquisitions for the transportation category. The list includes a selection of assets and is not inclusive of all expected acquisitions for each year.

Figure 11-15: Projected Upcoming Acquisitions

Year	Category	Description	Estimated Cost
2025	Roads	Emerald Crossing subdivision (part 1 of 2)	$849,715
2025	Sidewalks	Emerald Crossing subdivision (part 1 of 2)	$114,175
2025	Streetlights	Emerald Crossing subdivision (part 1 of 2)	$221,264
2025	Roads	Hyland Village subdivision	$1,399,677
2025	Sidewalks	Hyland Village subdivision	$289,930
2025	Streetlights	Hyland Village subdivision	$360,796
2029	Traffic Lights	Signalized intersection at Barnett Drive	$1,200,000

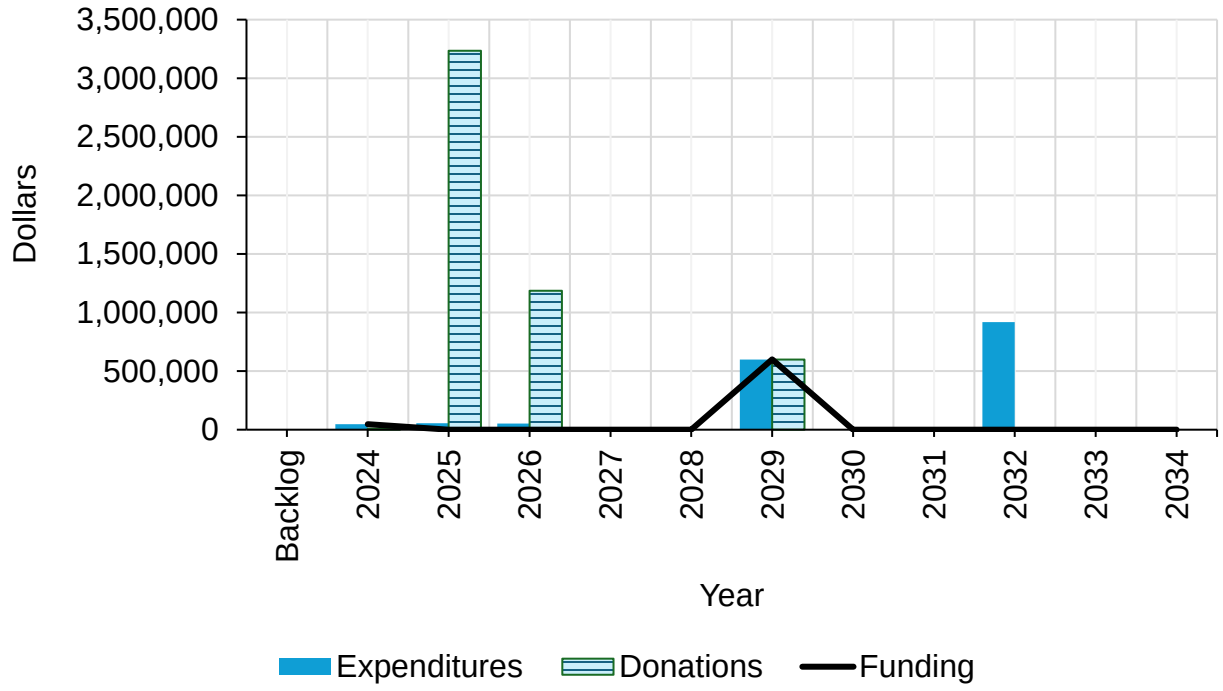
Figure 11-16 highlights projected acquisition expenditures over the planning period.

Figure 11-16: Projected Acquisition Expenditures

Planning Period	Year	Projected Expenditures	Donations	Projected Funding	Balance
Backlog	Backlog	$0	$0		$0
Year 0	2024	$46,462	$10,000	$46,462	$0
Year 1	2025	$56,250	$3,235,558	$0	-$56,250
Year 2	2026	$53,625	$1,185,155	$0	-$53,625
Year 3	2027	$0	$0	$0	$0
Year 4	2028	$0	$0	$0	$0
Year 5	2029	$600,000	$600,000	$600,000	$0
Year 6	2030	$0	$0	$0	$0
Year 7	2031	$0	$0	$0	$0
Year 8	2032	$917,470	$0	$0	-$917,470
Year 9	2033	$0	$0	$0	$0
Year 10	2034	$0	$0	$0	$0
Total		**1,673,807**	**5,030,713**	**$646,462**	**-$1,027,345**

Figure 11-17 summarizes the acquisition activity below.

Figure 11-17: Acquisition Overview



Over the planning period, the acquisition lifecycle is projected to have a funding gap of $1,027,345. This is largely due to the realignment of Industrial Rd estimated to be scheduled for 2032 and arriving at $834,970 in road construction costs. As outlined in the 2024 Adopted Budget, this realignment project is currently unfunded and will require additional review by the Town's contract engineering firm to solidify the cost estimate before funding can be allotted.

A grand total of $5,030,713 in donated assets are forecasted for the planning period. While these assets do not require funding, they will have future lifecycle costs long-term. As will be explored further in this section, transportation assets have significant operating and maintenance costs, particularly associated with roads and sidewalks. Between the Hyland Village and Emerald Crossing subdivisions, a total of 4.7 km of new roads and 6.9 km of new sidewalks will be added to the Town's asset inventory.

11.4.3 Operation and Maintenance

The compilation of operation and maintenance expenditures for transportation assets was achieved through consultation with staff and sourcing of financial data from the 2024 Adopted Budget and other project estimates.

Figure 11-18 showcases the operation expenditures for each year of the planning period.

Figure 11-18: Projected Operation Expenditures

Planning Period	Year	Primary Expenditures	Secondary Expenditures	Total Projected Expenditures	Projected Funding	Balance
Year 0	2024	$1,354,291	$0	$1,354,291	$1,354,291	$0
Year 1	2025	$1,389,027	$25,000	$1,414,027	$1,414,027	$0
Year 2	2026	$1,409,007	$0	$1,409,007	$1,409,007	$0
Year 3	2027	$1,445,144	$0	$1,445,144	$1,445,144	$0
Year 4	2028	$1,465,934	$0	$1,465,934	$1,465,934	$0
Year 5	2029	$1,612,136	$0	$1,612,136	$1,612,136	$0
Year 6	2030	$1,635,943	$27,500	$1,663,443	$1,663,443	$0
Year 7	2031	$1,677,267	$0	$1,677,267	$1,677,267	$0
Year 8	2032	$1,817,295	$0	$1,817,295	$1,817,295	$0
Year 9	2033	$1,862,590	$0	$1,862,590	$1,862,590	$0
Year 10	2034	$1,890,717	$0	$1,890,717	$1,890,717	$0
Total		**$17,559,351**	**$52,500**	**$17,611,851**	**$17,611,851**	**$0**

Figure 11-19 outlines maintenance expenditures.

Figure 11-19: Projected Maintenance Expenditures

Planning Period	Year	Primary Expenditures	Secondary Expenditures	Total Projected Expenditures	Projected Funding	Balance
Year 0	2024	$329,480	$8,172	$337,652	$337,652	$0
Year 1	2025	$336,070	$1,581	$337,651	$337,651	$0
Year 2	2026	$342,791	$0	$342,791	$342,791	$0
Year 3	2027	$349,647	$0	$349,647	$349,647	$0
Year 4	2028	$356,640	$0	$356,640	$356,640	$0
Year 5	2029	$363,773	$0	$363,773	$363,773	$0
Year 6	2030	$371,048	$200,000	$571,048	$371,048	-$200,000
Year 7	2031	$378,469	$200,000	$578,469	$378,469	-$200,000
Year 8	2032	$386,038	$200,000	$586,038	$386,038	-$200,000
Year 9	2033	$393,759	$200,000	$593,759	$393,759	-$200,000
Year 10	2034	$401,634	$200,000	$601,634	$401,634	-$200,000
Total		**$4,009,348**	**$1,009,753**	**$5,019,101**	**$4,019,101**	**-$1,000,000**

On the following page, the operation and maintenance overviews are presented as Figure 11-20 and 11-21.

Figure 11-20: Operation Overview

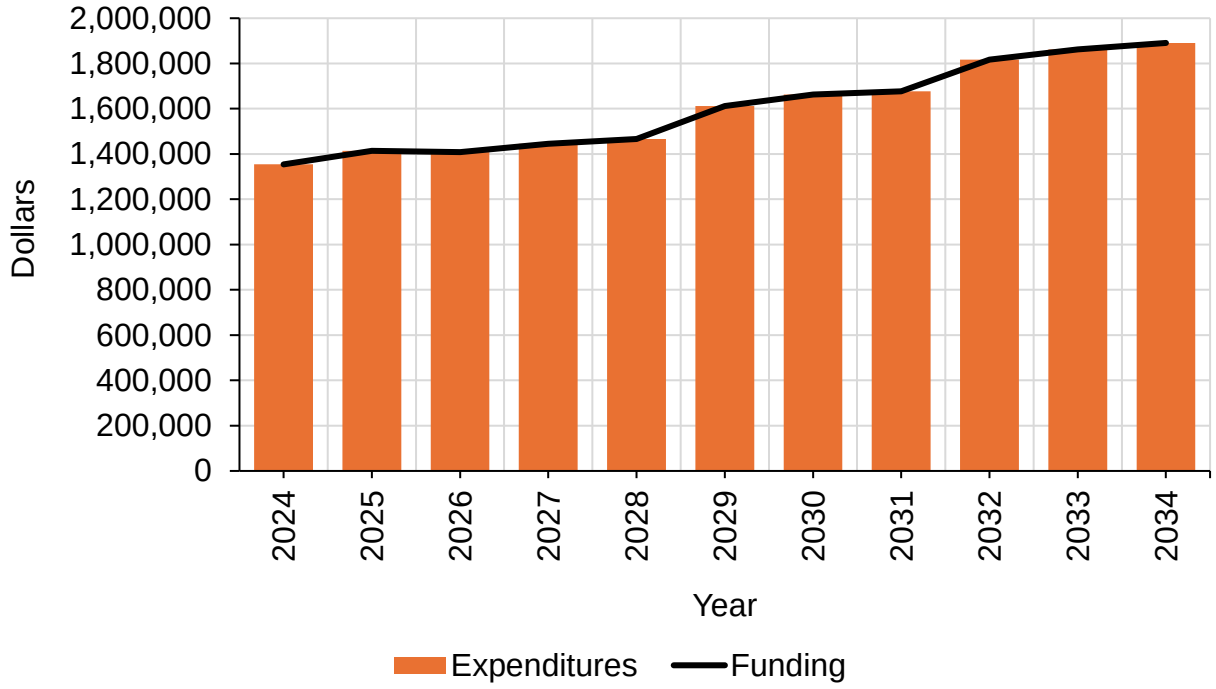
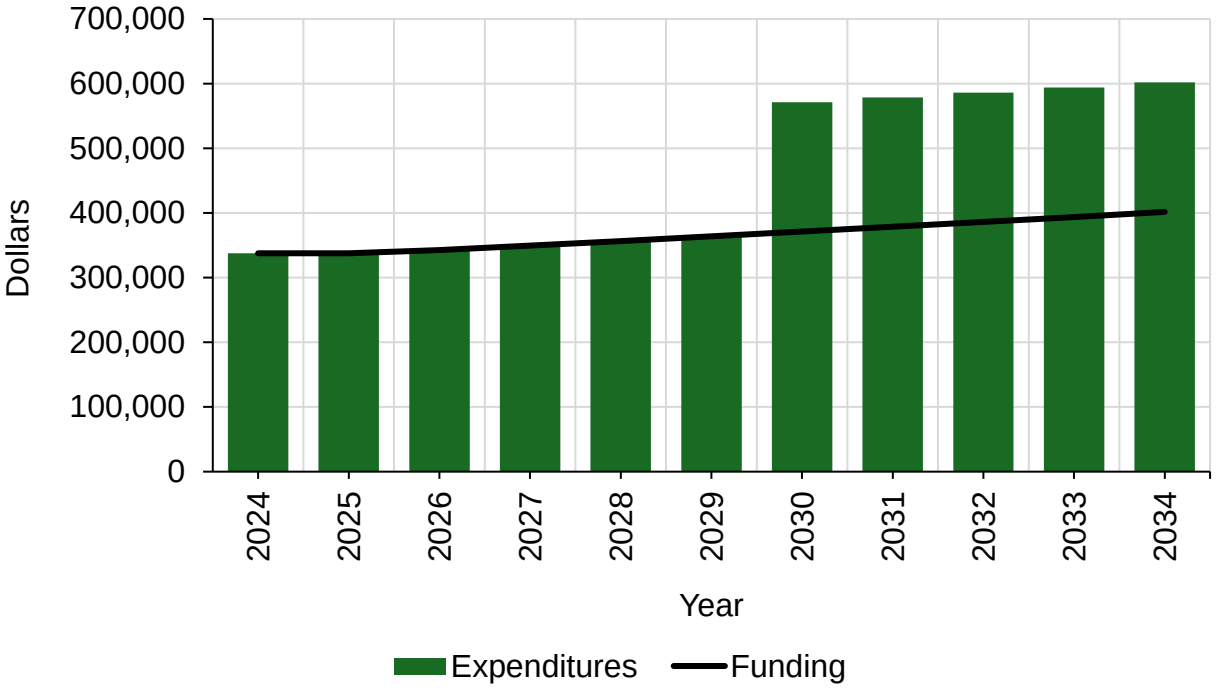


Figure 11-21: Maintenance Overview



On the following pages, Figure 11-22 and 11-23 provide examples of operation and maintenance activities.

Figure 11-22: Operation Activities

Category	Activity	Interval	Description	Purpose
Roads	Ontario Minimum Maintenance Standards Patrols	Road Class Dependent	Visual inspection of roadways and documentation of deficiencies.	Compliance with Ontario Minimum Maintenance Standards.
Roads	Roads Needs Study	5 Years	Detailed inspection of roads and sidewalks with forecasted maintenance requirements.	Supports long-term planning for roads and sidewalks.
Roads	Traffic Calming	Annual	Operation of digital radar speed signs for traffic counts and speed statistics.	Identification of roads for further analysis and potential implementation of traffic calming measures.
Sidewalks	Sidewalk Inspections	Annual	Visual inspection of sidewalks for the identification of surface and structural deficiencies.	Compliance with Ontario Minimum Maintenance Standards.
Signs	Retro-Reflectivity Inspections	Annual	Visual inspection of signs for retro-reflectivity.	Compliance with Ontario Minimum Maintenance Standards.
Streetlights	Inspection	Monthly	Streetlights are inspected for deficiencies.	Compliance with Ontario Minimum Maintenance Standards.
Traffic Lights	Inspection	Annual	Functionality of traffic light is inspected.	Compliance with Ontario Minimum Maintenance Standards.

Figure 11-23: Maintenance Activities (Table 1 of 2)

Category	Activity	Interval	Description	Purpose
Roads	Cold Patch Pothole Repair	As Needed	Application of cold patch asphalt for pothole repair during winter months.	Prolonged life of infrastructure.
Roads	Dust Suppression	Annual	Application of magnesium chloride to surface of gravel roads.	Reduced dust volume.
Roads	Grading	Annual	Regrading and recrowning of gravel roads.	Prolonged life of infrastructure and improved ride quality.
Roads	Hot Patch Pothole Repair	As Needed	Application of hot patch asphalt for pothole repair during summer months.	Prolonged life of infrastructure.
Roads	Line Painting	Annual	Painting of pavement markings.	Maintain clear and visible pavement markings for safe road use.
Roads	Loose-Leaf Collection	Annual	Loose leaves are collected from gutter.	Surface is clear and safe for use.
Roads	Pulverization	As Needed	Pulverization of compacted gravel for isolated repairs of gravel roads.	Improved condition, ride quality, and drainage.
Roads	Street Sweeping	Annual	Debris is collected and road surface is swept.	Surface is clear and safe for use.
Roads	Winter Maintenance	As Needed	Snow and ice mitigation as required.	Compliance with Ontario Minimum Maintenance Standards.
Sidewalks	Debris Removal	Annual	Debris is swept or washed from select sidewalks during the spring.	Surface is clear, safe for use, and aesthetics are maintained.
Sidewalks	Grass Repair	Annual	Grass adjacent to sidewalk is repaired following winter maintenance.	Restoration of natural surface and aesthetics are maintained.

Figure 11-23: Maintenance Activities (Table 2 of 2)

Category	Activity	Interval	Description	Purpose
Sidewalks	Panel Grinding	Annual	Removal of trip hazards.	Compliance with Ontario Minimum Maintenance Standards.
Sidewalks	Panel Replacement	Annual	Replacement of damaged or deteriorating sidewalk panels.	Compliance with Ontario Minimum Maintenance Standards.
Sidewalks	Winter Maintenance	As Needed	Snow and ice mitigation as required.	Compliance with Ontario Minimum Maintenance Standards.
Streetlights	Maintenance	As Needed	Repair of streetlights deficiencies.	Compliance with Ontario Minimum Maintenance Standards.
Traffic Lights	Maintenance	As Needed	Repair of traffic light deficiencies.	Compliance with Ontario Minimum Maintenance Standards.

Overall, the operation and maintenance lifecycle activities for the transportation network indicate a funding shortfall of $1,000,000. This gap stems from an unfunded secondary maintenance expense of $200,000 per year beginning in 2030 to support an LED upgrade project for all streetlights. The project is estimated to be structured in phases with a set amount of funding allocated per year. Once completed, the use of LED bulbs will provide cost-savings for annual streetlight utility expenses, which are currently projected to amount to $883,137 between 2024 and 2030. In addition to reduced energy consumption, LED bulbs will likely provide greater luminance for road and sidewalk users.

Additional secondary maintenance expenditures include continued traffic calming measures for 2024 and 2025 totaling $9,753. In addition, $2,000 per year is allocated to the signs category to support the use of digital radar speed signs. These signs support traffic calming measures by collecting data related to traffic volumes and speed.

When reviewing operation and maintenance expenditures, it is important to be mindful of the acquisitions discussed in section 11.4.2. Each asset that is added to our inventory will arrive with operating expenses and maintenance requirements. As mentioned, a total of 4.7 km of roads and 6.9 km of sidewalks will be assumed from the Emerald Crossing and Hyland Village subdivisions. To understand the potential impact to operation and maintenance expenses, these lengths are 13% and 22% of the existing inventory, respectively. Additional expenses may be seen in areas such as:

- Engineering services
- General maintenance materials
- Labour
- Winter control materials

Other potential impacts to the level of funding for operating and maintenance is related to the potential for changes to legislation. For example, if regulations were to dictate that road patrols must increase in frequency and deficiencies be resolved sooner, this would likely result in higher costs related to labour and materials.

11.4.4 Replacement

Supported by recommendations from staff and the Town's contract engineering firm, a replacement strategy for transportation assets was assembled through the consultation of financial and planning documents, such as the 2024 Adopted Budget and the 2020 Roads Needs Study.

Due to the most recent Roads Needs Study being conducted in 2020, the town relies on support from annual condition assessments conducted with the Town's contract engineering firm to determine which roads are priority for surface replacement or total

reconstruction. Until the next Roads Needs Study in 2025, specific road segments will not be forecasted for a given year in the 2024 Asset Management Plan. Instead, the age-based replacement date (end of useful life) of each road will be visualized against a consistent funding amount of $300,000 per year. Each year, this annual funding is applied to the road segment(s) selected for resurfacing.

Similarly, sidewalk segments have not been assigned a replacement date in the 2024 Asset Management Plan due to replacement activities being guided by annual condition inspections. The 2025 Roads Needs Study will include vital information for sidewalks which will support the Town's forecasting efforts over the next 5 years. As mentioned for roads, the annual funding for sidewalk repairs ($60,000 in 2024) will be visualized for each year alongside the age-based replacement date for each sidewalk.

A subset of upcoming replacements is shown in Figure 11-24.

Figure 11-24: Projected Upcoming Replacements

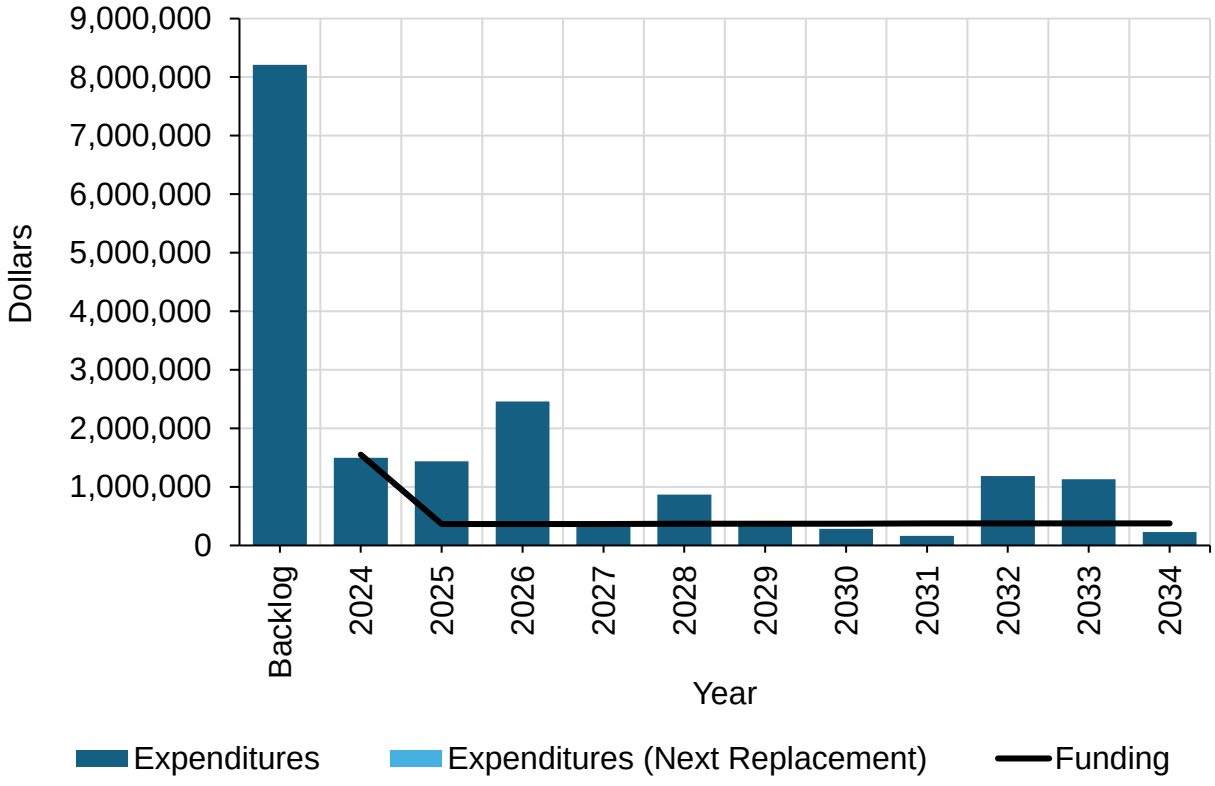
Year	Category	Asset ID	Description	Forecast
2024	Roads	Various	Owen Sound Street resurfacing	$1,300,212
2024	Streetlights	Pending	Downtown core streetlight	$4,500
2026	Roads	Various	Steeles Street reconstruction	$1,156,793
2026	Roads	Various	Centennial Road reconstruction	$1,151,846

On the following page, Figure 11-25 outlines replacement expenditures followed by the replacement overview as Figure 11.26.

Figure 11-25: Projected Replacement Expenditures

Planning Period	Year	Projected Expenditures	Projected Funding	Balance
Backlog	Backlog	$8,207,240		-$8,207,240
Year 0	2024	$1,494,994	$1,551,188	$56,194
Year 1	2025	$1,434,535	$365,790	-$1,068,745
Year 2	2026	$2,459,058	$367,106	-$2,091,953
Year 3	2027	$362,743	$368,448	$5,705
Year 4	2028	$868,304	$369,817	-$498,487
Year 5	2029	$352,149	$371,213	$19,064
Year 6	2030	$284,876	$372,637	$87,762
Year 7	2031	$163,742	$374,090	$210,348
Year 8	2032	$1,187,990	$375,572	-$812,418
Year 9	2033	$1,130,721	$377,083	-$753,638
Year 10	2034	$229,782	$378,625	$148,843
Total		**$18,176,135**	**$5,271,570**	**-$12,904,564**

Figure 11-26: Replacement Overview



Overall, the replacement lifecycle activity for transportation assets indicates a total funding shortfall of $12,904,564. This is largely due to the immense number of unfunded assets in the backlog. While the presence of backlog items is largely due to the age-based replacement date being utilized, it does represent the end result compared to the current level of funding over the planning period. It is important to note that assets added to the replacement strategy based solely on age leverage a replacement cost in 2024 dollars.

Outside of the backlog, the average funding gap is $1,045,048 for each of the five unfunded years. As the Town continues to improve its asset management program, it is likely the gap for each year can be better modelled by scheduling transportation assets to be replaced in a given year instead of relying on the end date for each asset's useful life. However, the expenditures outside of the backlog amount to $9,968,895, while the total funding amounts to $5,271,570. This is a shortfall of $4,697,325 over the 10-year planning period.

As mentioned at the beginning of the section, allocated budget for the annual road resurfacing program is modelled at a consistent $300,000 in the 2024 Asset Management Plan, mirroring the 2024 Adopted Budget. These funds stem from OCIF grant funding. The other road project that is 100% funded is the resurfacing of Owen Sound Street in 2024, which is funded though the Connecting Link grant for an estimated total of $1,300,212.

11.4.5 Lifecycle Overview

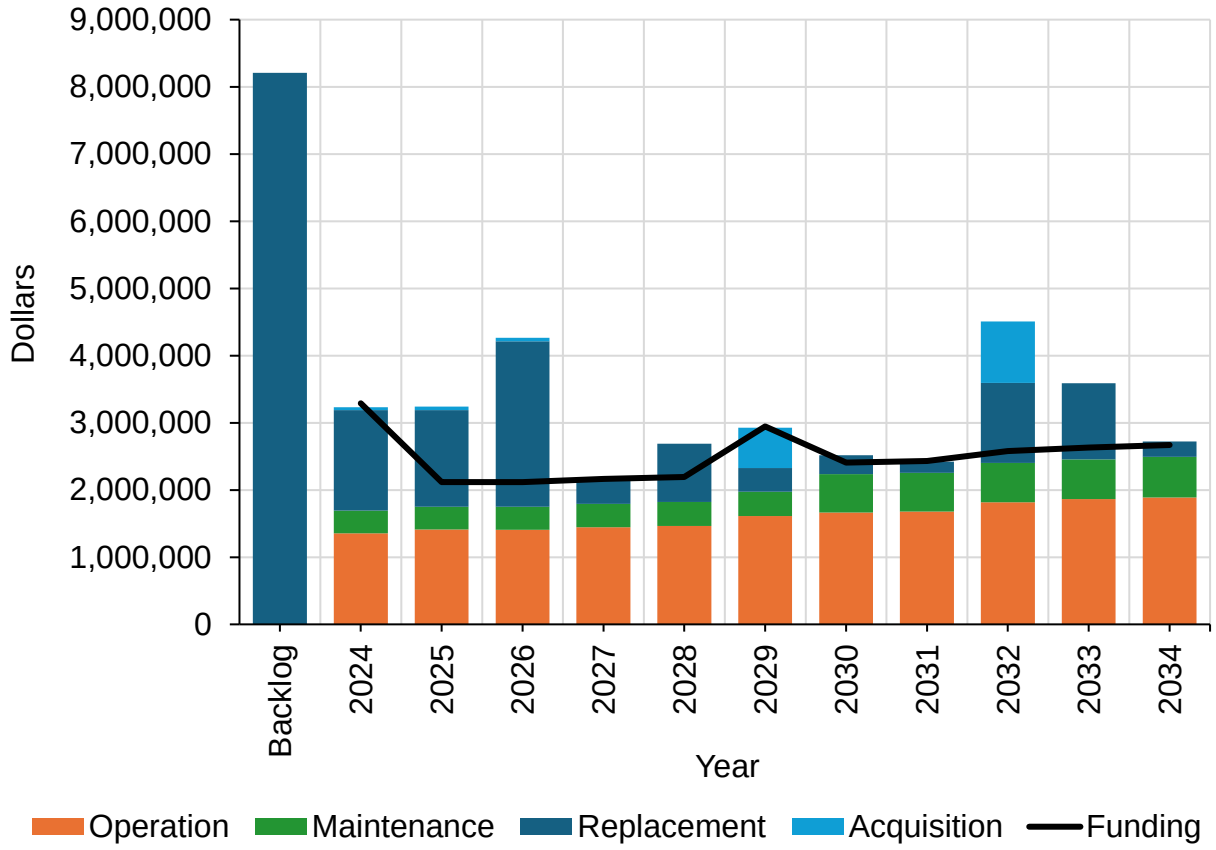
Bringing together all elements of the lifecycle strategy for transportation, the projected lifecycle expenditures table is found on the following page as Figure 11-27.

Figure 11-27: Projected Lifecycle Expenditures

Planning Period	Year	Acquisition	Operation	Maintenance	Replacement	Total Expenditures	Total Funding	Balance
Backlog	Backlog	$0			$8,207,240	$8,207,240		-$8,207,240
Year 0	2024	$46,462	$1,354,291	$337,652	$1,494,994	$3,233,399	$3,289,593	$56,194
Year 1	2025	$56,250	$1,414,027	$337,651	$1,434,535	$3,242,463	$2,117,467	-$1,124,995
Year 2	2026	$53,625	$1,409,007	$342,791	$2,459,058	$4,264,482	$2,118,904	-$2,145,578
Year 3	2027	$0	$1,445,144	$349,647	$362,743	$2,157,533	$2,163,238	$5,705
Year 4	2028	$0	$1,465,934	$356,640	$868,304	$2,690,878	$2,192,391	-$498,487
Year 5	2029	$600,000	$1,612,136	$363,773	$352,149	$2,928,058	$2,947,122	$19,064
Year 6	2030	$0	$1,663,443	$571,048	$284,876	$2,519,367	$2,407,129	-$112,238
Year 7	2031	$0	$1,677,267	$578,469	$163,742	$2,419,478	$2,429,826	$10,348
Year 8	2032	$917,470	$1,817,295	$586,038	$1,187,990	$4,508,793	$2,578,905	-$1,929,888
Year 9	2033	$0	$1,862,590	$593,759	$1,130,721	$3,587,071	$2,633,433	-$953,638
Year 10	2034	$0	$1,890,717	$601,634	$229,782	$2,722,134	$2,670,976	-$51,157
Total		**$1,673,807**	**$17,611,851**	**$5,019,101**	**$18,176,135**	**$42,480,894**	**$27,548,985**	**-$14,931,909**

Below, Figure 11-28 highlights the lifecycle overview.

Figure 11-28: Lifecycle Overview



Overall, the transportation asset category lifecycle strategy ends with a total funding gap of $14,931,909. As discussed in section 11.4.4, this is largely due to the multitude of assets indicated as backlogged, which accounts for $8,207,240 (55%) of the total lifecycle deficit.

With the arrival of the 2025 Roads Needs Study, staff will be able to better plan for long-term transportation replacement needs, which is likely to reduce the number of assets in the backlog. This is due to the currently lifecycle modelling to largely be dependent on asset age, which is not suitable as the sole indication of condition.

11.5 Risk Management

Transportation assets provide a critical service for residents, the organization, and the surrounding population. Residents depend on reliable transportation to support their daily lives. Additionally, transportation assets are a key role for the delivery of emergency services. As a result, it is vital to evaluate the risk associated with the category.

11.5.1 Critical Assets

Identifying critical assets is the first step to risk management. Understanding the most important aspects of the transportation network will allow for effective decision making when weighing capital investment.

Figure 11-29 suggests road assets which are likely to be considered critical.

Figure 11-29: Critical Road Assets

Category	Critical Asset
Roads	Greenwood Street
Roads	Luxton Way
Roads	Main Street East
Roads	Main Street West
Roads	O'Flynn Street
Roads	Owen Sound Street
Roads	Prentice Drive
Roads	Rintoul Crescent

Below, Figure 11-30 outlines sidewalk assets.

Figure 11-30: Critical Sidewalk Assets

Category	Critical Asset
Sidewalks	Main Street East
Sidewalks	Main Street West
Sidewalks	Owen Sound Street

11.5.2 Risk Assessment

Assessing the lifecycle strategy outlined in section 11.4 shows a significant need for additional funding. When making decisions regarding the level of investment, it is critical to understand the relationship between underfunding an activity and the risk that may be introduced.

Figure 11-31 demonstrates the connection between deferring lifecycle activities and the potential risk that may be introduced for transportation assets.

Figure 11-31: Lifecycle Activities and Potential Risk

Deferred Activity	Potential Risk
Acquisition	▪ Increased likelihood of restrictive road and sidewalk connectivity ▪ Increased likelihood of safety issues due to absent traffic control devices ▪ Increased likelihood of traffic backups due to absent traffic control devices
Operation and Maintenance	▪ Increased likelihood of frequent deficiencies ▪ Increased likelihood of reduced performance ▪ Increased likelihood of legal non-compliance
Replacement	▪ Increased likelihood of decreased performance due to age ▪ Increased likelihood of higher maintenance costs due to age ▪ Increased likelihood of higher replacement costs due to age

11.5.3 Potential Service Impact

Should a critical asset fail, an impact to the services provided by the transportation asset category would result.

On the following two pages, Figure 11-32 and 11-33 highlight potential service impacts due to failure.

Figure 11-32: Potential Road Service Impacts (Table 1 of 2)

Category	Critical Asset	Potential Service Impact
Roads	Greenwood Street	▪ Loss of access for ambulance services ▪ Disruption to emergency services response capabilities ▪ Disruption to access for residential properties
Roads	Luxton Way	▪ Loss of access for municipal Operations Yard and water tower ▪ Unable to transport machinery, equipment, and vehicles from the Operations Yard
Roads	Main Street East	▪ Unable to support regional transportation network ▪ Unable to support high volumes of personal, commercial, and industrial traffic ▪ Loss of access for high number of commercial businesses ▪ Disruption to emergency services response capabilities ▪ Disruption to access for residential properties
Roads	Main Street West	▪ Unable to support regional transportation network ▪ Unable to support high volumes of personal, commercial, and industrial traffic ▪ Loss of access for commercial businesses ▪ Disruption to emergency services response capabilities ▪ Disruption to access for residential properties
Roads	O'Flynn Street	▪ Loss of access for fire services ▪ Disruption to emergency services response time ▪ Disruption to access for residential properties
Roads	Owen Sound Street	▪ Unable to support regional transportation network ▪ Unable to support high volumes of personal, commercial, and industrial traffic ▪ Loss of access for high number of commercial businesses ▪ Disruption to emergency services response capabilities ▪ Disruption to access for residential properties
Roads	Prentice Drive	▪ Loss of access for municipal Operations Yard and water tower ▪ Unable to transport machinery, equipment, and vehicles from the Operations Yard
Roads	Rintoul Crescent	▪ Loss of access for ambulance services ▪ Disruption to emergency services response capabilities ▪ Disruption to access for residential properties

Figure 11-32: Potential Service Impacts (Table 2 of 2)

Category	Critical Asset	Potential Service Impact
Sidewalks	Main Street East	▪ Disruption to access for high number of commercial businesses ▪ Disruption to access for residential properties
Sidewalks	Main Street West	▪ Disruption to access for high number of commercial businesses ▪ Disruption to access for residential properties
Sidewalks	Owen Sound Street	▪ Disruption to access for high number of commercial businesses ▪ Disruption to access for residential properties

11.5.4 Potential Consequences

In the event of critical asset failure, consequences for the organization arrive alongside impacts to service. Figure 11-33 suggests potential consequences in the event of failure based on the service impacts discussed in section 11.5.3.

Figure 11-33: Potential Consequences

Consequence Type	Likelihood
Environmental	Unlikely
Financial	Likely
Health/Safety	Likely
Legal/Compliance	Likely
Operational	Likely
Reputational	Likely
Service Delivery	Likely

11.5.5 Climate Change

Climate change has the potential to introduce a variety of factors that may impact the governance and management of transportation assets stemming from environmental, economic, and political changes.

Below, Figure 11-34 explores factors of climate change and the potential risk to transportation lifecycle activities.

Figure 11-34: Climate Change Risks

Factor	Potential Impact	Potential Lifecycle Risk
Frequency of Severe Weather	▪ Increase frequency of high rainfall events resulting in flooding. ▪ Increased risk of damage to assets, particularly streetlights and traffic lights.	▪ Higher maintenance costs due to increased frequency of surface repairs. ▪ Higher maintenance costs to manage damaged infrastructure.
Higher Average Temperatures	▪ Increased heat stress on asphalt roads and concrete sidewalks. ▪ Increased expansion/contraction of materials.	▪ Higher maintenance costs to manage increase wear and tear. ▪ More frequent replacements due to lower service life of affected assets.
Regulatory and Legislative Changes	▪ Increased cost of construction materials. ▪ Increased cost of electricity.	▪ Higher operating costs due to streetlights utilities. ▪ Higher acquisition and replacement costs to construct assets.
Seasonal Weather Variance	▪ Reduced predictability of seasonal weather changes. ▪ Increased frequency of freeze/thaw cycles.	▪ Increased operating and maintenance costs for unplanned winter control activities.

Considering the potential for climate change to impact the organization's approach to managing transportation assets is critical for informed long-term decision making.

11.6 Recommendations

The transportation asset category has several areas for improvement in terms of the data available in the asset inventory.

First, continue “asset cleanup” initiatives in which grouped assets which should be represented as multiple records are split. Having an accurate real-world representation in the asset inventory will allow for more effective condition modeling and replacement costs.

Second, the Town’s asset management program should focus on a strategy to begin scheduling road and sidewalk assets for replacement over the long-term in asset management planning documents. While Town staff and the Town’s contract engineering firm is acutely aware of road and sidewalk needs, it is key for this information to continue to be integrated into the asset inventory to support long-term decision making.

Last, explore opportunities to refine the process for road and sidewalk visual condition inspections. At minimum, the inspections should reference the related asset ID, and ideally follow a structure which allows for straightforward upload to the asset inventory. Options to achieve this will likely be able to leverage the Town’s existing GIS infrastructure and mobile enterprise asset management software.

Section 12 – Wastewater

12.1 Quantity and Replacement Cost

Wastewater assets are spread across seven segments. Figure 12-1 outlines the quantity and replacement cost for each.

Figure 12-1: Quantity and Replacement Cost (2024)

Segment	Inventory Quantity	Estimated Quantity	Inventory Replacement Cost
Cleanouts	1	-	$6,568
Fittings	30	-	$193,456
Gravity Mains	472	35.3 km	$12,505,605
Maintenance Holes	432	562 ea	$3,203,844
Network Structures	62	-	$25,465,854
Pressurized Mains	1	0.4 km	$158,809
Service Lines	1,704	1,907 ea	$3,095,237
Total	**2,703**	**-**	**$44,629,373**

To understand the structure of Figure 12-1, the below provides additional information for select columns.

- *Inventory Quantity* refers to the number of records in the asset inventory.
- *Estimated Quantity* refers to the estimate of real-world quantities, where enabled by available data.
- *Inventory Replacement Cost* refers to the inventory-based replacement cost.

In terms of assets not in scope, all wastewater infrastructure constructed for the Emerald Crossing and Hyland Village subdivisions has been excluded until each subdivision is assumed by the Town.

The large quantity of assets in the network structures segment is the result of the wastewater treatment plant being split into components such as clarifiers, lagoons, shell, HVAC, etc. This is to model the age and condition of each element more accurately.

The wastewater inventory contains significant information from older data sources, such as spreadsheets predating the Town's asset management software. In some instances, this results in missing or inadequate information that prevents a cost-per-unit from being assigned to a segment reliably. Where unit costs could not be calculated, the historical cost of each asset was inflated to the year 2024.

12.2 Age and Condition

12.2.1 Age

Figure 12-2 highlights the useful life and average age of wastewater assets. As mentioned in previous sections, the average age is based on the number of years an asset has been in service, while the useful life is established by the Town's asset management program based on a reasonable estimate of how many years assets in the segment are likely to perform before requiring replacement.

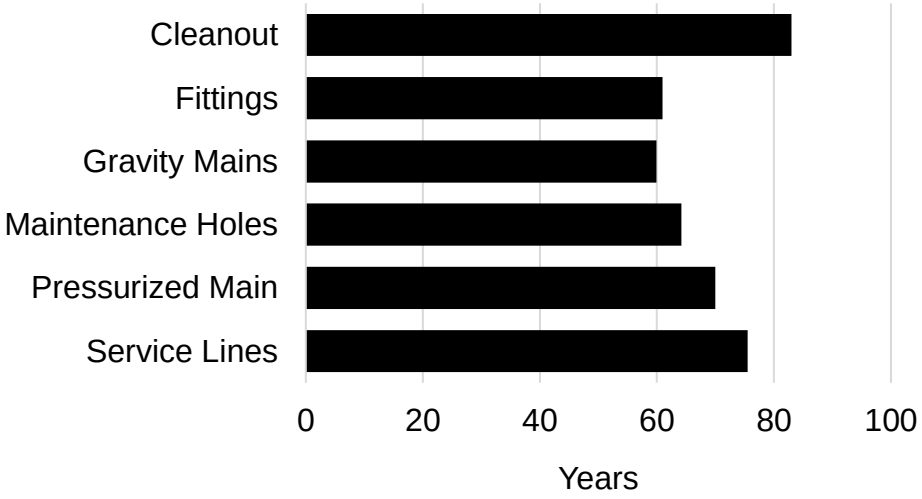
Figure 12-2: Useful Life and Average Age (2024)

Segment	Useful Life	Average Age
Cleanouts	100 Years	17 Years
Fittings	50-100 Years	38 Years
Gravity Mains (50 Year)	50-100 Years	35 Years
Maintenance Holes	100 Years	36 Years
Network Structures	15-70 Years	22 Years
Pressurized Mains	100 Years	30 Years
Service Lines	100 Years	38 Years

The useful life assigned to the network structures segment varies based on the asset. This is due to many structures being split components such as HVAC, shell and electrical. As a result, these separate elements all must be assigned an appropriate useful life.

On the following page, Figure 12-3 showcases the average remaining useful life of wastewater assets.

Figure 12-3: Average Remaining Useful Life (2024)



Network structures have excluded from Figure 12-3 due to the significant variation in useful life assigned to the assets.

12.2.2 Condition

The condition of Shelburne's wastewater network is closely monitored by municipal and Ontario Clean Water Agency (OCWA) staff. A variety of inspections are conducted at regular intervals to ensure the infrastructure is free from deficiencies and able to accommodate its rated capacity. These activities are further discussed in Section 12.4.

As mentioned in Section 8.1, much of the wastewater asset inventory is accompanied by missing or potentially inaccurate secondary data, such as the material or diameter of a gravity main. In some cases, this prevents an entry in the asset inventory from being confidently assigned to a physical piece of infrastructure. As a result, it is not beneficial to factor in field condition assessments with the wastewater inventory at this time, and age-based condition assessments are used as substitute.

Below, Figure 12-4 displays the age-based condition rating scale.

Figure 12-4: Condition Rating Scale

Condition	Rating
Very Good	80.00 and above
Good	60.00 and above
Fair	40.00 and above
Poor	20.00 and above
Very Poor	0.00 and above

Figure 12-5 highlights the average age-based condition rating for wastewater assets.

Figure 12-5: Average Age-Based Condition Rating (2024)

While age-based condition ratings are limited in their ability to provide a detailed report of asset condition, they can still provide key insight if the useful life for each asset is accurately assigned. For example, if a gravity main constructed of PVC has an industry-standard service life of 100 years, it is not inaccurate to suggest that an 75 year-old PVC gravity main may have a reduced condition based solely on age.

For this reason, it is vital the Town continues to evaluate the suitable useful life assigned to infrastructure, sourcing information from recent construction projects and the Town's contract engineering firm.

12.3 Level of Service

Wastewater infrastructure provides a critical service for residents. The safe and reliable disposal of sewage is cornerstone to human and environmental health. It is therefore important to understand what elements of the service customers value most.

12.3.1 Level of Service Objectives

Level of service objectives aid in defining level of service by assembling a list of qualitative statements that reflect the priorities of residents. These statements are each linked to a relevant service parameter which is used to translate level of service objectives into measurable performance indicators.

Figure 12-6 suggests applicable level of service objectives for wastewater.

Figure 12-6: Level of Service Objectives

Service Parameter	Objective Statement
Availability	The wastewater network can meet the needs of the community.
Capacity	The wastewater network can reach all existing and future customers.
Reliability	The wastewater network is maintained to minimize the likelihood of disruption.
Responsiveness	Municipal staff are available for questions and assistance.
Safety	The wastewater network is managed responsibly to prioritize health and safety.

12.3.2 Performance Measures

Establishing performance measures allows the organization to remain informed as to how well the category is achieving the desired level of service. As mentioned in section 12.3.1, performance measures are linked to the service parameters that structure the objectives which support the values of customers.

Refinement and data collection for performance measures is underway to ensure suitability for the July 1, 2025 requirements of Ontario Regulation 588/17. As a result, further discussion surrounding the current and target performance of each measure has been excluded for wastewater assets from the 2024 Asset Management Plan.

Please refer to section 12.3.1, 12.3.2, and 12.3.3 for more information regarding the Town's approach to measuring the performance of wastewater assets.

On the following page, Figure 12-7 outlines applicable performance measures.

Figure 12-7: Performance Measures

Service Parameter	Performance Measure	Target
Availability	Average daily flow is less than 80% of rated capacity.	Less than 80%
Reliability	Number of emergency repairs to wastewater infrastructure.	0 repairs
Reliability	Number of wastewater backups due to municipal infrastructure.	0 backups
Responsiveness	Municipal staff response time to customer inquiries.	1 business day
Safety	Number of effluent violations.	0 violations

12.3.3 Legislated Performance Measures

Ontario Regulation 588/17 dictates specific performance measures for the wastewater asset category. Please note that legislation uses the terminology “service attribute” in place of “service parameter”. For consistency with other categories in the 2024 Asset Management Plan, “service parameter” will be substituted for “service attribute”. Figures 12-8 and 12-9 structure the presentation of legislated level of service data.

Figure 12-8: Legislated Technical Performance Measures

Service Parameter	Performance Measure	Performance (2023)
Scope (Capacity)	Percentage of properties connected to the municipal wastewater system.	95.5%
Reliability	The number of events per year where combined sewer flow in the municipal wastewater system exceeds system capacity compared to the total number of properties connected to the municipal wastewater system.	0
Reliability	The number of connection-days per year having wastewater backups compared to the total number of properties connected to the municipal wastewater system.	0.0003
Reliability	The number of effluent violations per year due to wastewater discharge compared to the total number of properties connected to the municipal wastewater system.	0

Figure 12-9: Legislated Community Performance Measures (Table 1 of 2)

Service Parameter	Performance Measure	Performance (2023)
Scope (Capacity)	Description, which may include maps, of the user groups or areas of the Municipality that are connected to the municipal wastewater system.	As of 2023, municipal wastewater service is provided to 3,154 properties through a network of 35.7 kilometers of gravity and pressurized mains. The system is supported by three pumping stations and one wastewater treatment facility processing over 1,000,000 cubic meters of sewage during the previous year.
Reliability	Description of how combined sewers in the municipal wastewater system are designed with overflow structures in place which allow overflow during storm events to prevent backups into homes.	As of 2023, the Town of Shelburne does not have any combined sewers.
Reliability	Description of the frequency and volume of overflows in combined sewers in the municipal wastewater system that occur in habitable areas or beaches.	As of 2023, the Town of Shelburne does not have any combined sewers.
Reliability	Description of how stormwater can get into sanitary sewers in the municipal wastewater system, causing sewage to overflow into streets or backup into homes.	Stormwater entering sanitary sewers can impact the performance of the wastewater collection network. Deficiencies in collection mains, such as cracks, can permit stormwater entry during high-volume rainfall or melt events. Municipal staff utilize a variety of resources, such as video inspections of the collection mains, to proactively identify and mitigate areas of concern in the infrastructure. Additionally, indirect connections such as weeping tiles and sump pumps that drain into a sanitary connection are responsible for routing stormwater into the wastewater network. High volumes of stormwater disrupt normal daily flows and can cause the wastewater treatment facility to temporarily exceed its rated capacity.

Figure 12-9: Legislated Community Performance Measures (Table 2 of 2)

Service Parameter	Performance Measure	Performance (2023)
Reliability	Description of how sanitary sewers in the municipal wastewater system are designed to be resilient to avoid events described above.	Shelburne's treatment facility has strategies in place for managing high-flow scenarios due to stormwater entering the wastewater system, such as utilizing its two lagoons to temporarily increase its intake capacity. When constructing new or replacing components of the wastewater network, the Town of Shelburne, in conjunction with its team of engineers, ensure design standards are followed that will allow the Town to continue providing a collection system its customers can rely on to be safe and sustainable.
Reliability	Description of the effluent that is discharged from sewage treatment plants in the municipal wastewater system.	The Town's wastewater treatment facility samples discharged effluent on a regular basis to ensure compliance with environmental regulations. Effluent parameters CBOD5, suspended solids, phosphorous, ammonia nitrogen, and e. coli are monitored and summarized annually in a public performance report for the facility.

Additional information regarding the current performance can be found in the 2023 Annual Sewage Report prepared by OCWA.

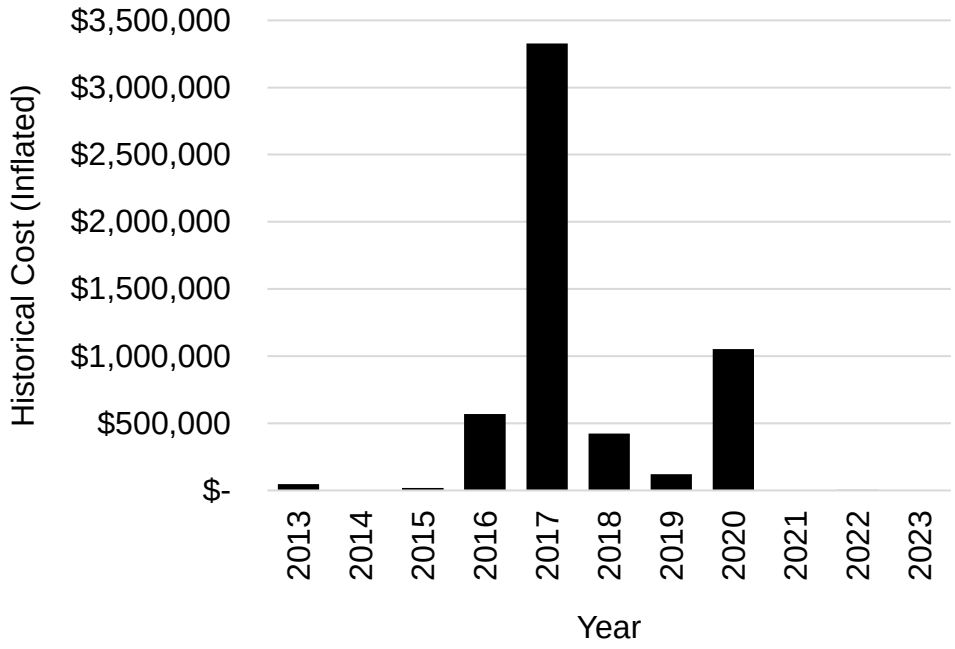
12.4 Lifecycle Strategy

The lifecycle strategy outlines the Town's approach to ensuring wastewater assets are managed in a way that maximizes the use of available funding while ensuring the level of service remains continues to meet expectations.

12.4.1 Recent Investment

To gain a better understanding of the level of investment for the wastewater category, Figure 12-10 highlights acquisitions and replacements over the last 10 years. To ensure a minimum level of standardization, the historical cost of all assets has been inflated to the year 2024 at a rate of 2% per year.

Figure 12-10: Recent Investment Overview



Examining Figure 12-10 highlights significant peaks of investment, particularly in 2017. First, this was largely due to the reconstruction of Ann St, Cedar St, Muriel St, Susan St, and Willow St. Second, several relining and repair projects were undertaken during the year which accounted for $384,967 (inflated) of value. Lastly, the construction of wastewater infrastructure on Luxton Way and Prentice Dr contributed just under $950,000 (inflated).

12.4.2 Acquisition

A schedule of acquisitions was determined through a review of long-term planning documents with staff. Included in the discussion was an estimate of the potential assumption year for the Emerald Crossing and Hyland Village subdivisions.

Figure 12-11 showcases upcoming wastewater acquisitions.

Figure 12-11: Projected Upcoming Acquisitions

Year	Description	Estimated Cost
2025	Emerald Crossing subdivision (part 1 of 2)	$2,818,969
2025	Hyland Village subdivision	$2,606,845
2026	Emerald Crossing subdivision (part 2 of 2)	$347,750

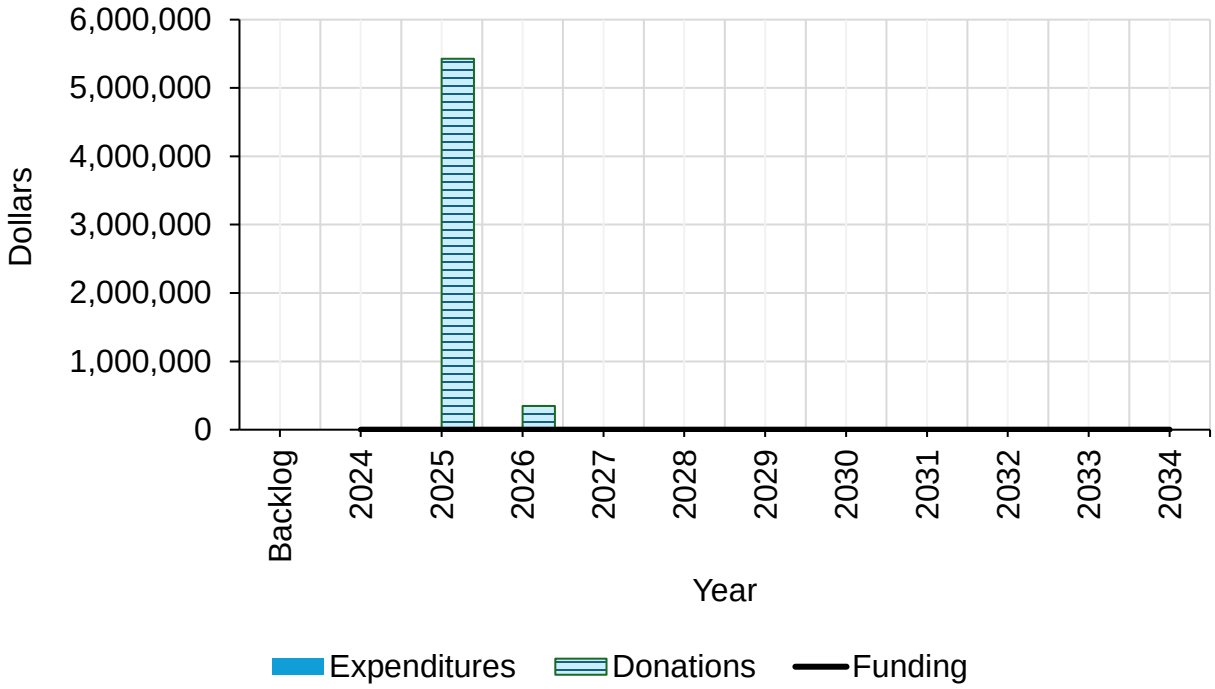
Figure 12-12 outlines projected acquisition expenditures over the planning period.

Figure 12-12: Projected Acquisition Expenditures

Planning Period	Year	Projected Expenditures	Donations	Projected Funding	Balance
Backlog	Backlog	$0	$0		$0
Year 0	2024	$0	$0	$0	$0
Year 1	2025	$0	$5,425,814	$0	$0
Year 2	2026	$0	$347,750	$0	$0
Year 3	2027	$0	$0	$0	$0
Year 4	2028	$0	$0	$0	$0
Year 5	2029	$0	$0	$0	$0
Year 6	2030	$0	$0	$0	$0
Year 7	2031	$0	$0	$0	$0
Year 8	2032	$0	$0	$0	$0
Year 9	2033	$0	$0	$0	$0
Year 10	2034	$0	$0	$0	$0
Total		**$0**	**$5,773,564**	**$0**	**$0**

Below, an overview of projected acquisition costs is found in Figure 12-13.

Figure 12-13: Acquisition Overview



Over the planning period, there are no forecasted acquisition expenses which will require municipal funding to achieve. The Emerald Crossing and Hyland Village subdivisions will contribute $3,116,719 and $2,606,845 of value to the Town's asset portfolio, respectively.

It is important to remember that although these assets do not have any construction costs to acquire, they will bring with them operation and maintenance expenditures, and ultimately will require significant investment for replacement. These factors are discussed further in this section.

12.4.3 Operation and Maintenance

The operation and maintenance strategy for wastewater was assembled by linking allotted funding found in the operating section of the 2024 Adopted Budget to lifecycle activities outlined for the category. Any non-recurring expenses (secondary expenditures) were reviewed as well.

Figure 12-14 highlights projected operation expenditures for the planning period.

Figure 12-14: Projected Operation Expenditures

Planning Period	Year	Primary Expenditures	Secondary Expenditures	Total Projected Expenditures	Projected Funding	Balance
Year 0	2024	$1,205,510	$0	$1,205,510	$1,205,510	$0
Year 1	2025	$1,229,620	$0	$1,229,620	$1,229,620	$0
Year 2	2026	$1,254,213	$0	$1,254,213	$1,254,213	$0
Year 3	2027	$1,279,297	$100,000	$1,379,297	$1,379,297	$0
Year 4	2028	$1,304,883	$100,000	$1,404,883	$1,404,883	$0
Year 5	2029	$1,385,285	$100,000	$1,485,285	$1,485,285	$0
Year 6	2030	$1,412,991	$100,000	$1,512,991	$1,512,991	$0
Year 7	2031	$1,441,250	$100,000	$1,541,250	$1,541,250	$0
Year 8	2032	$1,470,075	$100,000	$1,570,075	$1,570,075	$0
Year 9	2033	$1,499,477	$100,000	$1,599,477	$1,599,477	$0
Year 10	2034	$1,529,467	$100,000	$1,629,467	$1,629,467	$0
Total		**$15,012,067**	**$800,000**	**$15,812,067**	**$15,812,067**	**$0**

Below, Figure 12-15 outlines projected maintenance expenditures.

Figure 12-15: Projected Maintenance Expenditures

Planning Period	Year	Primary Expenditures	Secondary Expenditures	Total Projected Expenditures	Projected Funding	Balance
Year 0	2024	$269,000	$0	$269,000	$269,000	$0
Year 1	2025	$274,380	$0	$274,380	$274,380	$0
Year 2	2026	$279,868	$0	$279,868	$279,868	$0
Year 3	2027	$285,465	$70,000	$355,465	$355,465	$0
Year 4	2028	$291,174	$0	$291,174	$291,174	$0
Year 5	2029	$296,998	$70,000	$366,998	$366,998	$0
Year 6	2030	$302,938	$0	$302,938	$302,938	$0
Year 7	2031	$308,996	$70,000	$378,996	$378,996	$0
Year 8	2032	$315,176	$0	$315,176	$315,176	$0
Year 9	2033	$321,480	$70,000	$391,480	$391,480	$0
Year 10	2034	$327,909	$0	$327,909	$327,909	$0
Total		**$3,273,384**	**$280,000**	**$3,553,384**	**$3,553,384**	**$0**

On the following page, the operation and maintenance overviews are found in Figure 12-16 and 12-17.

Figure 12-16: Operation Overview

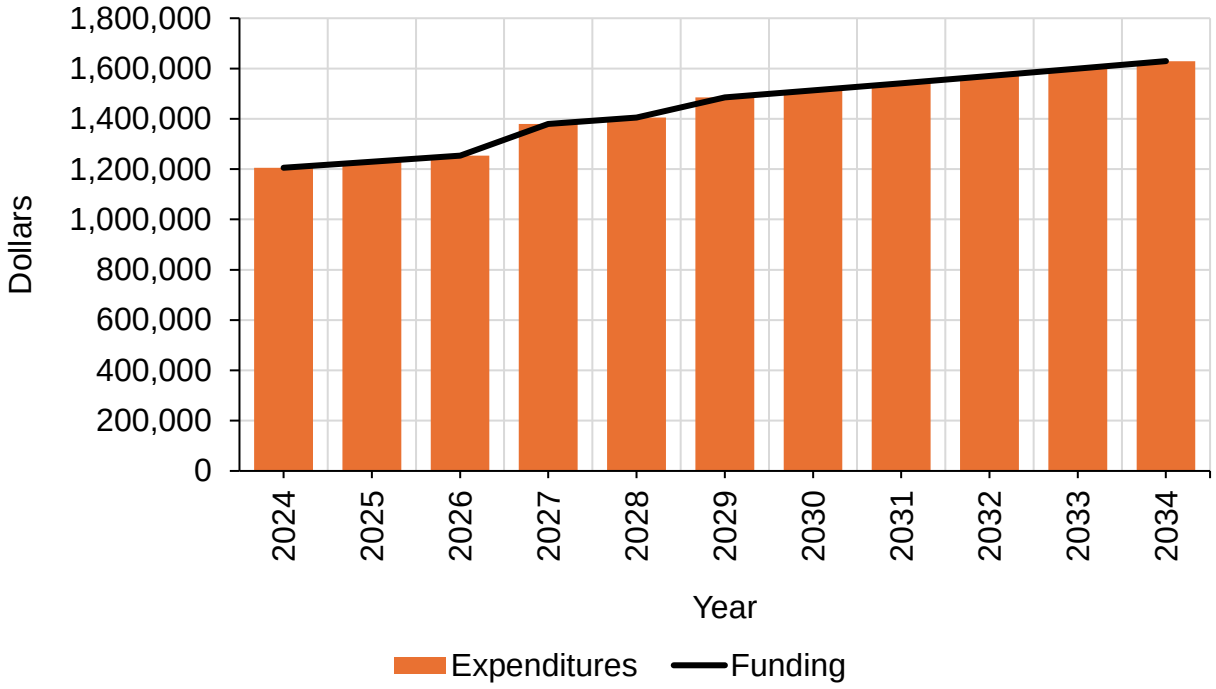
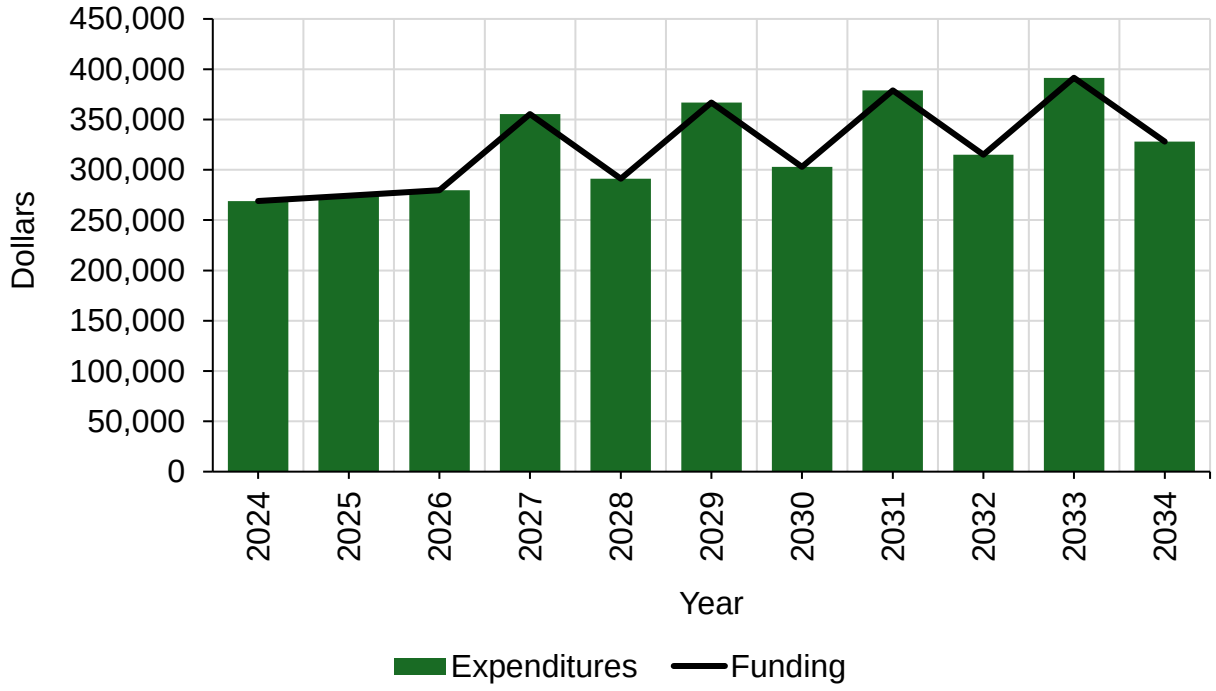


Figure 12-17: Maintenance Overview



On the following two pages, the operation and maintenance activities for the category are found in Figure 12-18 and 12-19, respectively.

Figure 12-18: Operation Activities

Segment	Activity	Interval	Description	Purpose
Gravity Mains	CCTV Inspection	As Needed	Video camera is placed inside gravity mains to check for deficiencies.	Improved awareness of infrastructure condition.
Pumping Stations	Flow Monitoring	Daily	Wastewater flows and pump hours are monitored and recorded.	Maintained performance of infrastructure.
Water Pollution Control Plant	Flow Monitoring	Daily	Wastewater flows and pump hours are monitored and recorded.	Maintained performance of infrastructure.
Relief Valves	Inspection	Bi-Annually	Relief valves are inspection and excess water is removed.	Prolonged life of infrastructure.
Maintenance Holes	Inspection	Annually	Inspection of structure and cover including checks for blockages and other debris.	Prolonged life of infrastructure.

Figure 12-19: Maintenance Activities

Segment	Activity	Interval	Description	Purpose
Pumping Stations	Debris Removal and Cleaning	Multiple	Debris is vacuumed from the wet well and all components are washed.	Proper conveyance of wastewater.
Pumping Stations	Float Cleaning	Bi-Weekly	Visual inspection, cleaning, and removal of obstructions from floats and inflow pipes.	Proper conveyance of wastewater.
All Network Structures	Floor Cleaning and Repainting	Annually	Floors are cleaned and repainted.	Maintained cleanliness and aesthetic of facility.
Gravity Main	Flushing	Annually	Water is flushed through the main at a high velocity for debris removal.	Proper conveyance of wastewater and reduced odor.
Pressurized Main	Flushing	Annually	Water is flushed through the main at a high velocity for debris removal.	Proper conveyance of wastewater and reduced odor.
Water Pollution Control Plan	Sludge Haulage	Annually	Removal of treated biosolids.	Maintained performance and capacity.
Pumping Stations	Valve Exercising	Monthly	Valves are opened, closed, and cleaned.	Prolonged life of infrastructure.

Examining wastewater operation and maintenance lifecycle activities indicates fully funded expenditures over the 10-year planning period. Both operation and maintenance have non-recurring expenses (secondary expenditures) scheduled for specific years.

For operation, a total of $100,000 per year ($800,000 in total) is allocated to support CCTV inspections of gravity mains. The reason this expense is not part of the regular recurring operation activities (primary expenditures) is due to it typically being scheduled every 5 years. The purpose of undertaking this activity each year from 2027 to 2034 is to catch up on backlogged CCTV inspections.

For maintenance, $70,000 every other year ($280,000 in total) from 2027 to 2033 is to support the re-lining of gravity mains. Re-lining is a method utilized by the Town to prolong the life of infrastructure and defer the higher cost replacement expenditures.

As mentioned in section 12.4.2, the Emerald Crossing and Hyland Village subdivisions will contribute $5,723,564 of wastewater assets to the Town's asset inventory. These new acquisitions will need to be supported by operation and maintenance activities, which will increase the required level of funding. The areas of operation and maintenance most likely to experience higher costs are:

- Labour
- Maintenance materials
- Professional fees

Recognizing that additional operation and maintenance costs will be required to maintain new infrastructure is key to a well-structured lifecycle strategy.

It should be noted that the activities discussed in this section reflect those by municipal staff. The activities do not include those performed by OCWA staff in operation of the water pollution control plant.

12.4.4 Replacement

The replacement strategy for wastewater was assembled in conjunction with various municipal staff and with support from long-term planning documents. Figure 12-20 highlights upcoming replacements.

Figure 12-20: Projected Upcoming Replacements

Year	Asset ID	Description	Projected Cost
2024	Various	Water Pollution Control Plant Upgrade and Expansion (Year 1)	$731,250
2025	Various	Pine Grove Avenue (Road Reconstruction)	$975,001
2025	Various	Water Pollution Control Plant Upgrade and Expansion (Year 2)	$13,893,750
2026	Various	Water Pollution Control Plant Upgrade and Expansion (Year 3)	$24,375,000
2027	Various	Water Pollution Control Plant Upgrade and Expansion (Year 4)	$9,750,000

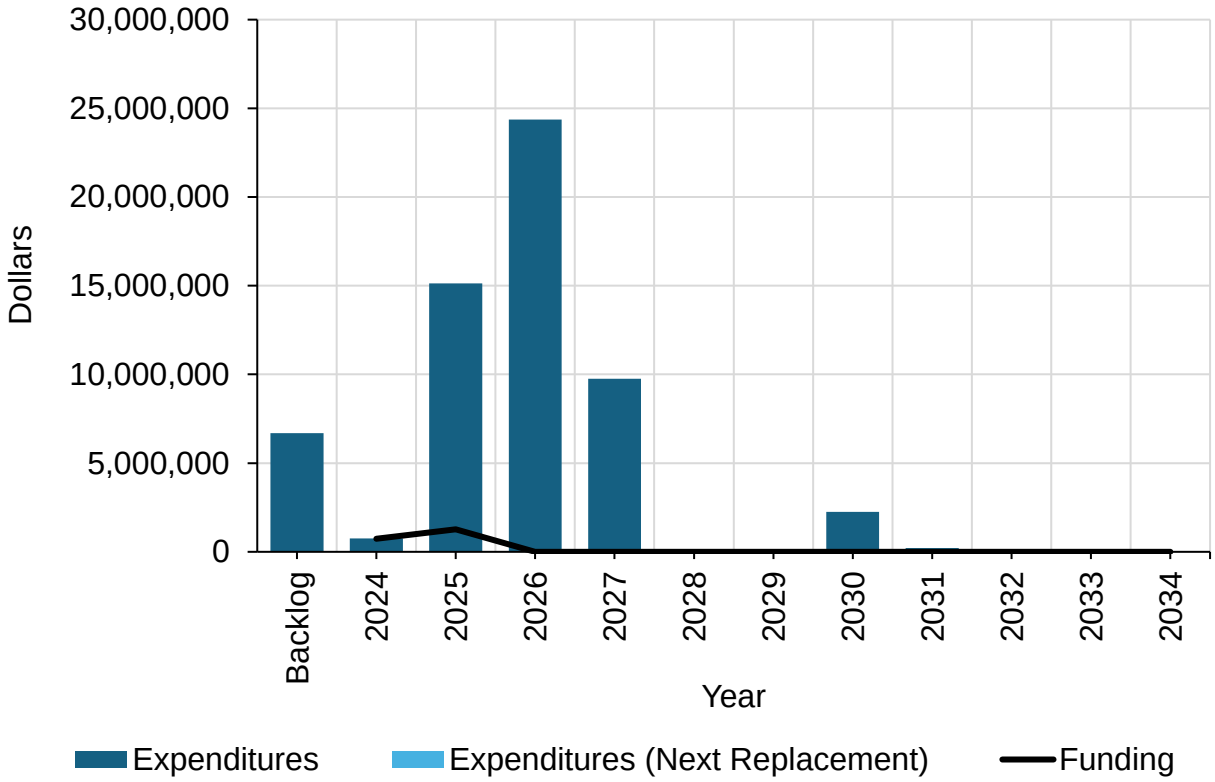
Figure 12-21 showcases projected replacement expenditures.

Figure 12-21: Projected Replacement Expenditures

Planning Period	Year	Projected Expenditures	Projected Funding	Balance
Backlog	Backlog	$6,689,329		-$6,689,329
Year 0	2024	$758,253	$731,250	-$27,003
Year 1	2025	$15,126,629	$1,268,750	-$13,857,879
Year 2	2026	$24,375,000	$0	-$24,375,000
Year 3	2027	$9,750,000	$0	-$9,750,000
Year 4	2028	$0	$0	$0
Year 5	2029	$73,738	$0	-$73,738
Year 6	2030	$2,259,626	$0	-$2,259,626
Year 7	2031	$220,046	$0	-$220,046
Year 8	2032	$0	$0	$0
Year 9	2033	$0	$0	$0
Year 10	2034	$0	$0	$0
Total		**$59,252,621**	**$2,000,000**	**-$57,252,621**

Below, the replacement overview is found in Figure 12-22.

Figure 12-22: Replacement Overview



The replacement lifecycle activity for wastewater indicates a funding shortfall of over $57M for the 10-year planning period.

The most significant expense over the planning period is the Water Pollution Control Plant Upgrade and Expansion project. Over four project years, this will amount to $48,750,000. Funding for this investment will stem from a combination of potential grants, debt, reserves, development charges, as well as other developer-related funding. As of 2024, a total of $2M has been allocated for the project. Various reports from staff and the Town's contract engineering firm can be referenced for more information regarding the project. Overall, the project accounts for over 80% of the funding shortfall, and in its absence the shortfall would be reduced to just over $10.5M.

In the asset inventory, the wastewater category struggles with up to date and reliable information for many small-value assets such as service lines and fittings. This results in challenges when attempting to model when an asset is likely to require replacement. In the case of Figure 12-21 and 12-22, assets outside of those outlined in Figure 12-20 appear in the year based solely on their age. For example, a gravity main with a useful life ending in 2030 will appear on these visuals as an expenditure in 2030. It is also key to note that these replacements reference a replacement cost in 2024 dollars.

12.4.5 Lifecycle Overview

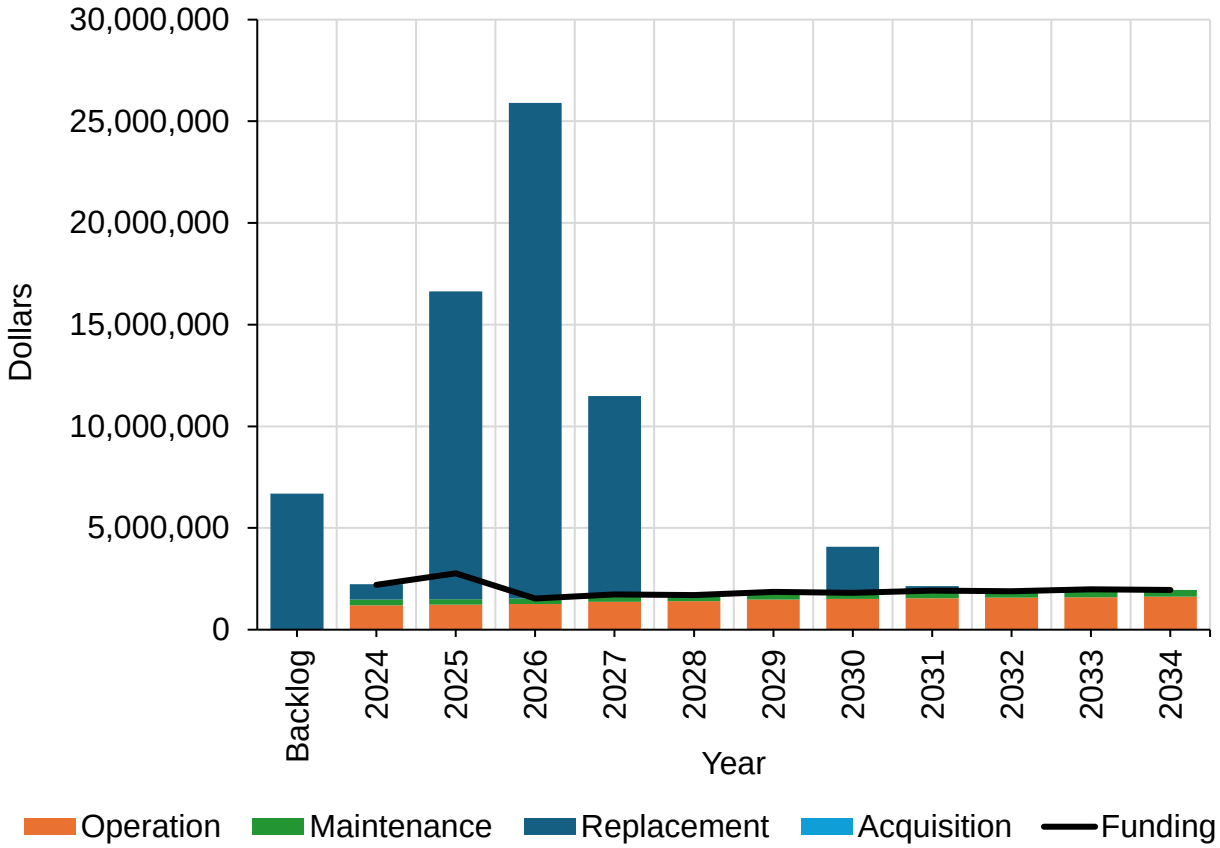
To assemble a clear picture of lifecycle costs for the wastewater category, the projected lifecycle expenditures are visualized in Figure 12-23 below.

Figure 12-23: Projected Lifecycle Expenditures

Planning Period	Year	Acquisition	Operation	Maintenance	Replacement	Total Expenditures	Total Funding	Balance
Backlog	Backlog	$0			$6,689,329	$6,689,329		-$6,689,329
Year 0	2024	$0	$1,205,510	$269,000	$758,253	$2,232,763	$2,205,760	-$27,003
Year 1	2025	$0	$1,229,620	$274,380	$15,126,629	$16,630,629	$2,772,750	-$13,857,879
Year 2	2026	$0	$1,254,213	$279,868	$24,375,000	$25,909,080	$1,534,080	-$24,375,000
Year 3	2027	$0	$1,379,297	$355,465	$9,750,000	$11,484,762	$1,734,762	-$9,750,000
Year 4	2028	$0	$1,404,883	$291,174	$0	$1,696,057	$1,696,057	$0
Year 5	2029	$0	$1,485,285	$366,998	$73,738	$1,926,021	$1,852,283	-$73,738
Year 6	2030	$0	$1,512,991	$302,938	$2,259,626	$4,075,554	$1,815,928	-$2,259,626
Year 7	2031	$0	$1,541,250	$378,996	$220,046	$2,140,293	$1,920,247	-$220,046
Year 8	2032	$0	$1,570,075	$315,176	$0	$1,885,252	$1,885,252	$0
Year 9	2033	$0	$1,599,477	$391,480	$0	$1,990,957	$1,990,957	$0
Year 10	2034	$0	$1,629,467	$327,909	$0	$1,957,376	$1,957,376	$0
Total		**$0**	**$15,812,067**	**$3,553,384**	**$59,252,621**	**$78,618,073**	**$21,365,452**	**-$57,252,621**

The lifecycle overview is visualized as Figure 12-24.

Figure 12-24: Lifecycle Overview



The wastewater category lifecycle strategy closes with a funding gap of $57,252,621, stemming only from forecasted replacements. Over 80% of this gap is due to the Water Pollution Control Plant Upgrade and Expansion project, which is forecasted to occur from 2024 to 2027 pending funding sources.

As staff continue to make improvements to the Town's asset management program, this will result in more effective modeling of replacement needs. This will reduce the total expenditures in the backlog and allow adequate budget to be assigned to specific assets in each year throughout the planning period.

12.5 Risk Management

The wastewater collection network provides an essential service for residents and businesses. Customers rely on the wastewater network to ensure sewage is safely collected and treated. For a category as critical as wastewater, risk is an important factor to consider when decision marking.

12.5.1 Critical Assets

Critical assets are those which carry the highest disruption to services and consequences for the organization in the event of failure. Figure 12-25 provides examples of critical assets in the wastewater category.

Figure 12-25: Critical Assets

Segment	Critical Asset
Gravity Mains	Trunk Mains
Network Structures	Water Pollution Control Plant
Network Structures	Pumping Stations
Pressurized Mains	All Assets

12.5.2 Risk Assessment

The lifecycle strategy for wastewater presented a funding shortfall for several years of the planning period. To address this, budgetary adjustments must be made to allocate funding or lifecycle activities must be modified or deferred. When weighing the decision to modify or defer a lifecycle activity, it is important to consider the risk that may be introduced. Figure 12-26 outlines the relationship between lifecycle activities and risk.

Figure 12-26: Lifecycle Activities and Potential Risk

Deferred Activity	Potential Risk
Acquisition	▪ Increased likelihood of capacity issues at treatment facilities ▪ Increased likelihood of higher maintenance costs due to sludge haulage ▪ Increased likelihood of development challenges due to capacity issues
Operation and Maintenance	▪ Increased likelihood of frequent deficiencies ▪ Increased likelihood of reduced performance ▪ Increased likelihood of legal non-compliance
Replacement	▪ Increased likelihood of capacity issues at treatment or pumping facilities ▪ Increased likelihood of decreased performance due to age ▪ Increased likelihood of higher maintenance costs due to age ▪ Increased likelihood of higher replacement costs due to age

12.5.3 Potential Service Impact

Should a critical asset fail, the essential services provided by the wastewater category for residents will be impacted. Figure 12-27 highlights potential service impacts.

Figure 12-27: Potential Service Impacts

Segment	Critical Asset	Potential Service Impact
Gravity Main	Trunk Mains	▪ Unable to convey wastewater from lower-tier collection mains to Water Pollution Control Plant. ▪ Lower-tier collection mains unable to handle wastewater volume, potential upstream backups.
Network Structures	Water Pollution Control Plant	▪ Unable to treat incoming wastewater from collection mains resulting in large-scale wastewater backups. ▪ Unable to meet legislative and environmental compliance for treatment.
Network Structures	Pumping Stations	▪ Unable to convey wastewater from lower elevations to higher elevation gravity mains for final conveyance to Water Pollution Control Plant. ▪ Gravity mains connected to pumping station unable to handle wastewater volume, potential upstream backups.
Pressurized Main	All Assets	▪ Unable to convey wastewater from lower elevations to higher elevation gravity mains for final conveyance to Water Pollution Control Plant. ▪ Gravity mains connected to pumping station unable to handle wastewater volume, potential upstream backups.

12.5.4 Potential Consequences

In addition to disruptions to service, the organization would be presented with consequences for the failure of a critical asset. In the context of wastewater, significant legislation and compliance related to health and the environment have the potential to greatly contribute to the severity.

On the following page, Figure 12-28 suggests potential consequences stemming from the possible service disruptions discussed above.

Figure 12-28: Potential Consequences

Consequence Type	Likelihood
Environmental	Likely
Financial	Likely
Health/Safety	Likely
Legal/Compliance	Likely
Operational	Likely
Reputational	Likely
Service Delivery	Likely

Understanding the consequences and resources required to resolve each one is an important consideration when weighing risk.

12.5.5 Climate Change

Factors resulting from climate change have the potential to impact the Town's operation of wastewater assets. To explore this further, Figure 12-29 outlines potential impacts of climate change, and the risk that may be introduced to the lifecycle strategy.

Figure 12-29: Climate Change Risks

Factor	Potential Impact	Potential Lifecycle Risk
Frequency of Severe Weather	▪ Increased frequency of high rainfall events resulting in flooding. ▪ Increased frequency of damage to exterior network structure elements.	▪ Higher operating and maintenance costs due to increased frequency of inflow and infiltration. ▪ Higher maintenance costs due to more frequent repairs to exterior network structure elements.
Higher Average Temperatures	▪ Increased rate of deterioration for exterior network structure elements.	▪ Higher maintenance costs to manage increase wear and tear. ▪ Higher acquisition and replacement costs for more resilient materials.
Regulatory and Legislative Changes	▪ Increased cost of wastewater treatment processes for environmental compliance. ▪ Increased cost of utilities.	▪ Higher operating and maintenance costs. ▪ Higher acquisition and replacement costs to purchase compliant equipment.

12.6 Recommendations

The wastewater asset category has room for improvement before the data can be reliably utilized as sole source of information for decision making. To improve the quality of the wastewater category, improvements targeting the structure of the asset inventory should be prioritized.

First, continuing to focus on linking records in the asset inventory to the Town's GIS infrastructure will improve several aspects of the information available for each asset. Additionally, it will allow for simplistic cross referencing of information in the GIS to information in the inventory.

Second, determine a strategy to link visual condition assessment data of wastewater assets to records in the inventory. This can be accomplished by establishing a clear relationship between the assessed condition and the condition rating scale available in the Town's enterprise asset management software. Having condition information readily available will allow for improved modeling of the category and support the development of planning documents such as annual budgets and asset management plans.

Section 13 – Water

13.1 Quantity and Replacement Cost

Water assets are organized into seven segments. Figure 13-1 displays the quantity and replacement cost for each.

Figure 13-1: Quantity and Replacement Cost (2024)

Segment	Inventory Quantity	Estimated Quantity	Inventory Replacement Cost
Curb Stops	31	2,524 ea	$1,721,598
Distribution Mains	292	50.5 km	$14,931,074
Fittings	52	-	$422,061
Hydrants	255	284 ea	$3,186,463
Network Structures	71	-	$14,918,221
Service Lines	2,055	2,655 ea	$1,573,863
Valves	339	506 ea	$847,376
Grand Total	**3,095**	**-**	**$37,600,656**

To understand the structure of Figure 13-1, the below provides additional information for select columns.

- *Inventory Quantity* refers to the number of records in the asset inventory.
- *Estimated Quantity* refers to the estimate of real-world quantities, where enabled by available data.
- *Inventory Replacement Cost* refers to the inventory-based replacement cost.

In terms of scope, all water infrastructure constructed for the Emerald Crossing and Hyland Village subdivisions has been excluded until each subdivision is assumed by the Town.

The large quantity of assets in the network structures segment is the result of the water facilities split into components such as pumps, piping, shell, HVAC, etc. This is to model the age and condition of each element more accurately.

13.2 Age and Condition

13.2.1 Age

Figure 13-2 indicates the useful life and average age for assets in the category. The useful life is determined by the Town's asset management program, and the average age references the number of years an asset has been in service.

Figure 13-2: Useful Life and Average Age (2024)

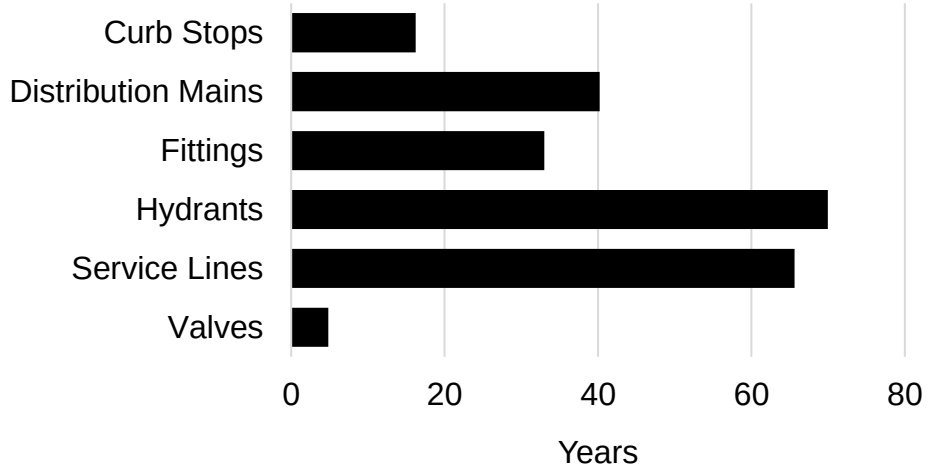
Segment	Useful Life	Average Age
Curb Stops	50 Years	35 Years
Distribution Mains	25-100 Years	30 Years
Fittings	50-100 Years	34 Years
Hydrants	100 Years	30 Years
Network Structures	7-50 Years	19 Years
Service Lines	50-100 Years	31 Years
Valves	25 Years	29 Years

The presence of varying useful life durations for each asset segment is due to three factors. First, a large amount of asset data stems from sources predating the Town's current approach to asset management and a ridged structure for service life was not followed as closely. Second, construction standards and materials have changed allowing assets to remain in service longer. Finally, some assets represent components, such as the network structures segment. Each individual component of a structure will have a different useful life.

To avoid disrupting the amortization of these assets, and because information as to why a different useful life was used is unavailable, the useful life will not be adjusted.

On the following page, Figure 13-3 highlights the average remaining useful life for assets in the category. The remaining useful life is calculated by comparing the year an asset reaches the end of its useful life to the year 2024.

Figure 13-3: Average Remaining Useful Life (2024)



Network structures have been excluded from the above chart due to the segment's varying useful life.

Reviewing Figure 13-3, valves present the lowest average remaining useful life by a large margin. The most likely explanation is the presence of outdated data in the asset inventory. When infrastructure is replaced, the outgoing asset must be removed from inventory to avoid disrupting summaries such as average remaining useful life. Alternatively, valves may not be using a suitable service life and can remain in-service for longer than is modelled in the inventory. The Town's asset management program will continue to review the useful life assigned to each category.

13.2.2 Condition

Similar to the wastewater category, Shelburne's water distribution network is managed by both municipal and OCWA staff. Highly regulated inspection and reporting standards, such as those outlined in O. Reg. 169/03 and 170/03, are followed on a regular basis to ensure the water meets the Ontario Drinking Water Quality Standards.

The Town continues to explore opportunities to incorporate visual condition inspection data into the asset inventory for analysis and modeling. Due to this being a work-in-progress, the age-based condition rating has been referenced for the 2024 Asset Management Plan.

For greater information regarding asset condition, OCWA prepares an Annual Report and Summary Report each year for the Town's water system. These reports discuss state of the water network and review topics such as flow rates, quality testing, and asset condition.

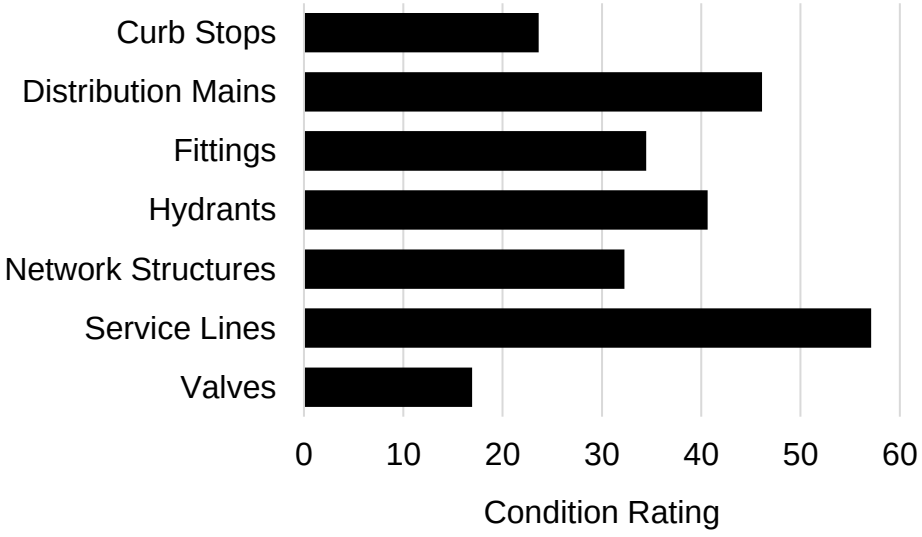
Figure 13-4 outlines the age-based condition scale.

Figure 13-4: Condition Rating Scale

Condition	Rating
Very Good	80.00 and above
Good	60.00 and above
Fair	40.00 and above
Poor	20.00 and above
Very Poor	0.00 and above

The average age-based condition rating for each segment is displayed in Figure 13-5 on the following page.

Figure 13-5: Average Age-Based Condition Rating (2024)



While age-based condition ratings do not account for observations during condition inspections, they can still be considered insightful when the service life applied to an asset is accurate. For example, a 95-year-old fire hydrant rated for 100 years of service is likely to be in lower condition compared to a 50-year-old hydrant.

As mentioned earlier, it is for this reason that it is vital for the Town to continue improving the data in the asset inventory, such as ensuring the useful life assigned to each segment is accurate.

13.3 Level of Service

Water distribution is an essential service for residents, businesses, and other services. Our customers depend on us to deliver a safe and uninterrupted source of drinking water. Level of service is an important step to understanding how well our organization is achieving the priorities of our customers.

13.3.1 Level of Service Objectives

Level of service objectives are qualitative statements used to represent what elements of the service our customers value most. Each objective is linked to a related service parameter which provides structure for further level of service discussions.

Figure 13-6 outlines applicable level of service objectives for the water category.

Figure 13-6: Level of Service Objectives

Service Parameter	Objective Statement
Availability	The water network can meet the needs of our community.
Capacity	The water network can reach all existing and future customers.
Reliability	The water network is maintained to minimize the likelihood of disruption.
Responsiveness	Municipal staff are available for questions and assistance.
Safety	The water network is managed responsibly to prioritize health and safety.

13.3.2 Performance Measures

To translate the qualitative level of service objectives into quantitative data, performance measures are utilized. Each performance measure is linked to the service parameters outlined above and support the objective statements.

Refinement and data collection for performance measures is currently underway to ensure suitability for the July 1, 2025 requirements of Ontario Regulation 588/17. As a result, further discussion surrounding the current and target performance of each measure has been excluded for water assets from the 2024 Asset Management Plan.

Please refer to section 13.3.1, 13.3.2, and 13.3.3 for more information regarding the Town's approach to measuring the performance of water assets.

On the following page, Figure 13-7 outlines applicable performance measures.

Figure 13-7: Performance Measures

Service Parameter	Performance Measure	Target
Reliability	Number of water main breaks that resulted in a loss of pressure or service.	0 breaks
Safety	Microbiological and chemical samples meet regulatory requirements for water quality.	100% compliance
Availability	Average daily flow at each well is less than 80% of maximum capacity.	Less than 80%
Responsiveness	Municipal staff response time to customer inquiries.	1 business day

13.3.3 Legislated Performance Measures

Ontario Regulation 588/17 outlines strategic performance measures for road assets. It should be noted that legislation uses the terminology “service attribute” in place of “service parameter”. To ensure consistency with other asset categories, “service parameter” will continue to be referenced in all figures.

Legislated performance measures are found in Figure 13-8 and 13-9..

Figure 13-8: Legislated Technical Performance Measures

Service Parameter	Performance Measure	Performance (2023)
Scope (Capacity)	Percentage of properties connected to the municipal water system.	97.4%
Scope (Capacity)	Percentage of properties where fire flow is available.	99.6%
Reliability	The number of connection-days per year where a boil water advisory notice is in place compared to the total number of properties connected to the municipal water system.	0.004039
Reliability	The number of connection-days per year where water is not available due to water main breaks compared to the total number of properties connected to the municipal water system.	0.00311

Figure 13-9: Legislated Community Performance Measures

Service Parameter	Performance Measure	Performance (2023)
Scope	Description, which may include maps, of the user groups or areas of the Municipality that are connected to the municipal water system.	As of 2023, the Town of Shelburne provides municipal water service to over 3,200 properties through 50.5 kilometers of distribution water mains stemming from six production wells and two water towers. As new residential homes are planned for construction in the next few years, the scale of Shelburne's water service will continue to grow to ensure the desired level of service is maintained.
Scope	Description, which may include maps, of the user groups or areas of the Municipality that have fire flow.	The Shelburne and District Fire Department provides fire protection services for the Shelburne community. The Municipality regularly inspects and maintains a network of over 250 fire hydrants to ensure a reliable high-pressure water flow is available to fire crews in the event of an emergency.
Reliability	Description of boil water advisories and service interruptions.	In 2023, the Town of Shelburne issued two boil water advisories. Clear communication was made available to the affected properties and on the Town’s website to ensure instructions were understood. Additionally, a single instance of interrupted service where positive pressure could not be maintained occurred in 2023.

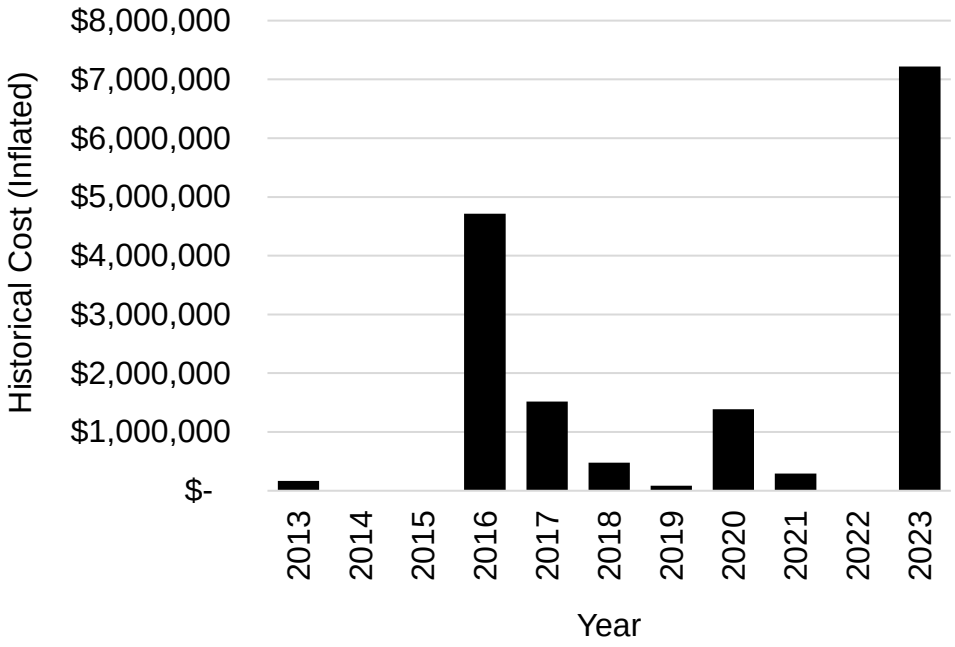
13.4 Lifecycle Strategy

The lifecycle strategy guides the level of investment and ensure the desired level of service can continue to be delivered for the water asset category. In this section, each stage of an asset's lifecycle is reviewed in detail.

13.4.1 Recent Investment

To provide greater context as to the level of investment allocated for water assets, Figure 13-10 highlights acquisition and replacement transactions over the past 10 years.

Figure 13-10: Recent Investment Overview



Recent investment indicates multiple peaks of investment over the past 10 years. These can be attributed to the following projects:

- Donated acquisition of Greenbrook subdivision phase 1-3 in 2016
- Acquisition of Well 5/6 and 7/8 in 2016
- Acquisition of second water tower in 2023

Between these three projects, a total of $11,762,968 (2024 inflated) was added to the category.

13.4.2 Acquisition

The forecast of acquisition needs for the water category was developed through consultation with staff and supported by documents which review long-term planning, such as the 2020 Development Charges Study. Figure 13-11 shows upcoming acquisitions for water distribution.

Figure 13-11: Projected Upcoming Acquisitions

Year	Description	Estimated Cost
2024	Well #9	$585,000
2025	Hyland Village subdivision	$776,950
2025	Emerald Crossing subdivision (part 1 of 2)	$490,550
2026	Emerald Crossing subdivision (part 2 of 2)	$490,550
2031	Distribution Main on Second Line	$700,000
2032	Industrial Rd realignment (new segment only)	$463,872
2034	Well #10	$12,000,000

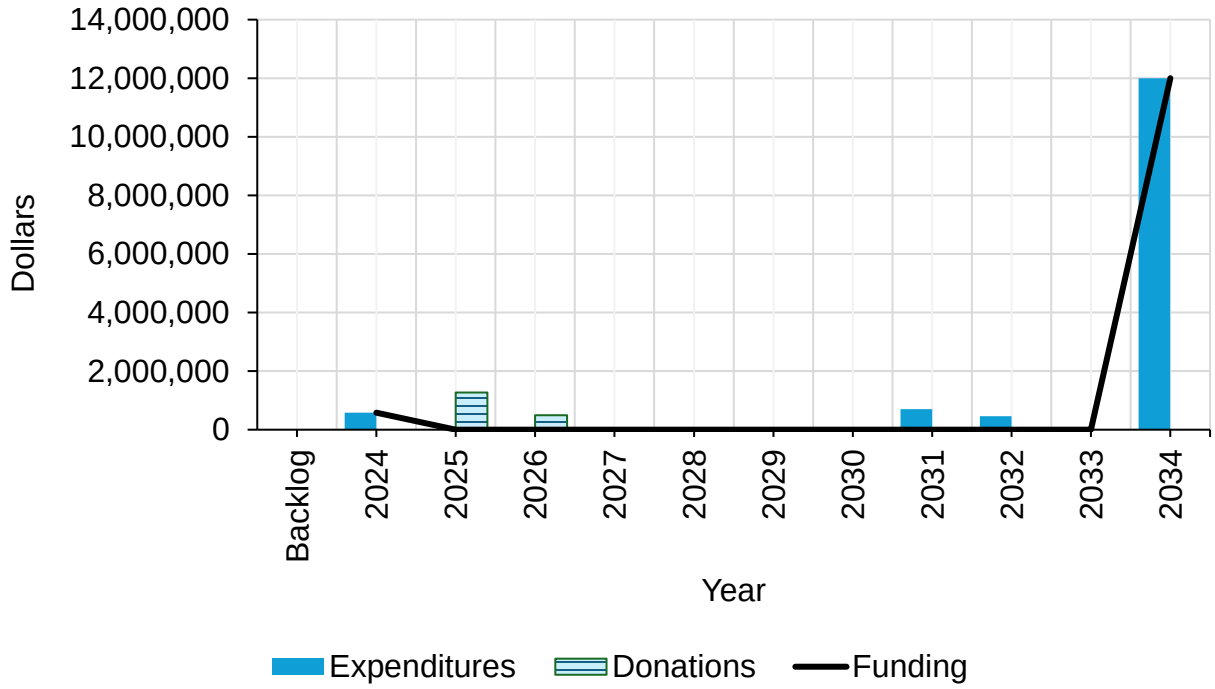
Figure 13-12 highlights projected acquisition expenditures.

Figure 13-12: Projected Acquisition Expenditures

Planning Period	Year	Projected Expenditures	Projected Donations	Projected Funding	Balance
Backlog	Backlog	$0	$0		$0
Year 0	2024	$585,000	$0	$585,000	$0
Year 1	2025	$0	$1,267,500	$0	$0
Year 2	2026	$0	$490,550	$0	$0
Year 3	2027	$0	$0	$0	$0
Year 4	2028	$0	$0	$0	$0
Year 5	2029	$0	$0	$0	$0
Year 6	2030	$0	$0	$0	$0
Year 7	2031	$700,000	$0	$0	-$700,000
Year 8	2032	$463,872	$0	$0	-$463,872
Year 9	2033	$0	$0	$0	$0
Year 10	2034	$12,000,000	$0	$12,000,000	$0
Total		**$13,748,872**	**$1,758,050**	**$12,585,000**	**-$1,163,872**

Below, the acquisition overview is found in Figure 13-13.

Figure 13-13: Acquisition Overview



With the exception of the new distribution main planned for construction beneath Second Line and the water infrastructure associated with the realignment of Industrial Rd, acquisitions are fully funded over the planning period. For funded projects, such as Well #9 and Well #10, the funding sources have been noted as a combination of development charges and reserves.

Although funding is not required to acquire donated assets, such as the $1,758,050 in infrastructure from the Emerald Crossing and Hyland Village subdivisions, an increased level of funding for the overall lifecycle strategy will be required to operate, maintain, and ultimately replace these donated assets.

13.4.3 Operation and Maintenance

Operation and maintenance expenses stem from those found in the 2024 Adopted Budget. These costs are then linked to the real-world activities required to support the category throughout the full lifecycle of assets.

Figure 13-14 highlights projected operation expenditures for the planning period.

Figure 13-14: Projected Operation Expenditures

Planning Period	Year	Primary Expenditures	Secondary Expenditures	Total Projected Expenditures	Projected Funding	Balance
Year 0	2024	$1,153,945	$0	$1,153,945	$1,153,945	$0
Year 1	2025	$1,174,811	$0	$1,174,811	$1,174,811	$0
Year 2	2026	$1,198,307	$0	$1,198,307	$1,198,307	$0
Year 3	2027	$1,222,273	$0	$1,222,273	$1,222,273	$0
Year 4	2028	$1,246,719	$0	$1,246,719	$1,246,719	$0
Year 5	2029	$1,325,958	$0	$1,325,958	$1,325,958	$0
Year 6	2030	$1,352,477	$0	$1,352,477	$1,352,477	$0
Year 7	2031	$1,379,526	$0	$1,379,526	$1,379,526	$0
Year 8	2032	$1,407,117	$0	$1,407,117	$1,407,117	$0
Year 9	2033	$1,435,259	$0	$1,435,259	$1,435,259	$0
Year 10	2034	$1,463,964	$0	$1,463,964	$1,463,964	$0
Total		**$14,360,356**	**$0**	**$14,360,356**	**$14,360,356**	**$0**

Figure 13-15 showcases maintenance expenses.

Figure 13-15: Projected Maintenance Expenditures

Planning Period	Year	Primary Expenditures	Secondary Expenditures	Total Projected Expenditures	Projected Funding	Balance
Year 0	2024	$187,975	$0	$187,975	$187,975	$0
Year 1	2025	$191,735	$1,248,100	$1,439,835	$1,439,835	$0
Year 2	2026	$195,569	$0	$195,569	$195,569	$0
Year 3	2027	$199,481	$0	$199,481	$199,481	$0
Year 4	2028	$203,470	$0	$203,470	$203,470	$0
Year 5	2029	$207,540	$0	$207,540	$207,540	$0
Year 6	2030	$211,690	$0	$211,690	$211,690	$0
Year 7	2031	$215,924	$0	$215,924	$215,924	$0
Year 8	2032	$220,243	$0	$220,243	$220,243	$0
Year 9	2033	$224,648	$0	$224,648	$224,648	$0
Year 10	2034	$229,140	$0	$229,140	$229,140	$0
Total		**$2,287,414**	**$1,248,100**	**$3,535,514**	**$3,535,514**	**$0**

An overview of operation and maintenance expenditures is found on the following page as Figure 13-16 and 13-17.

Figure 13-16: Operation Overview

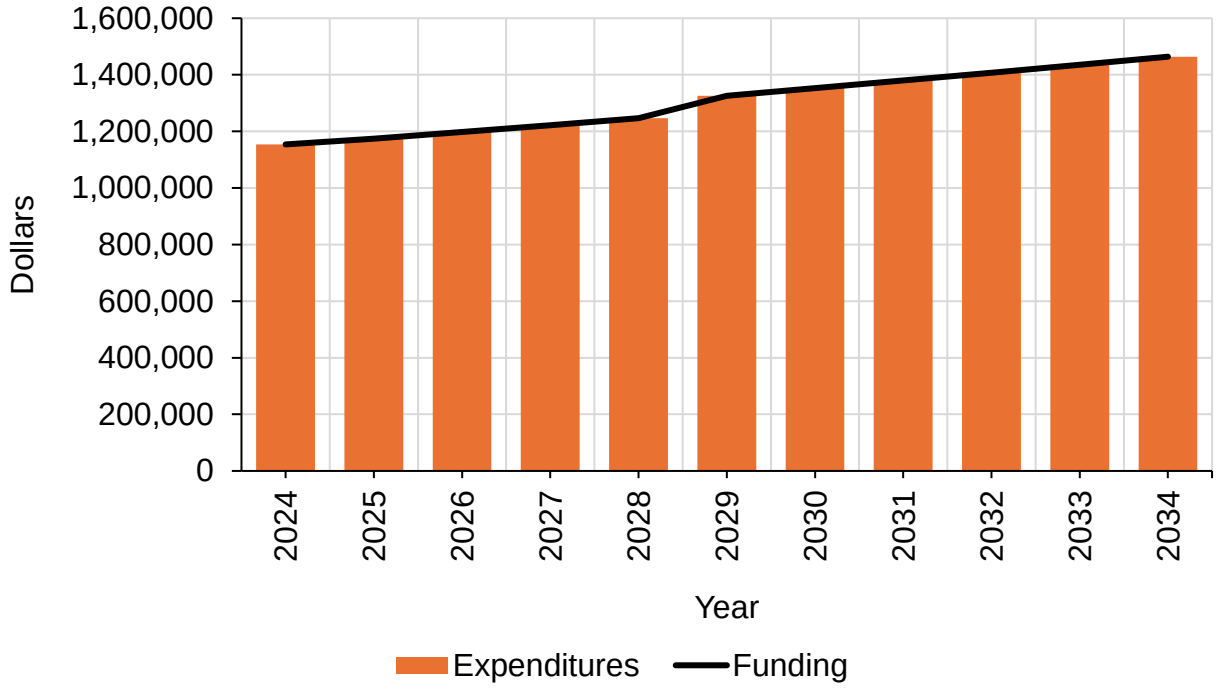
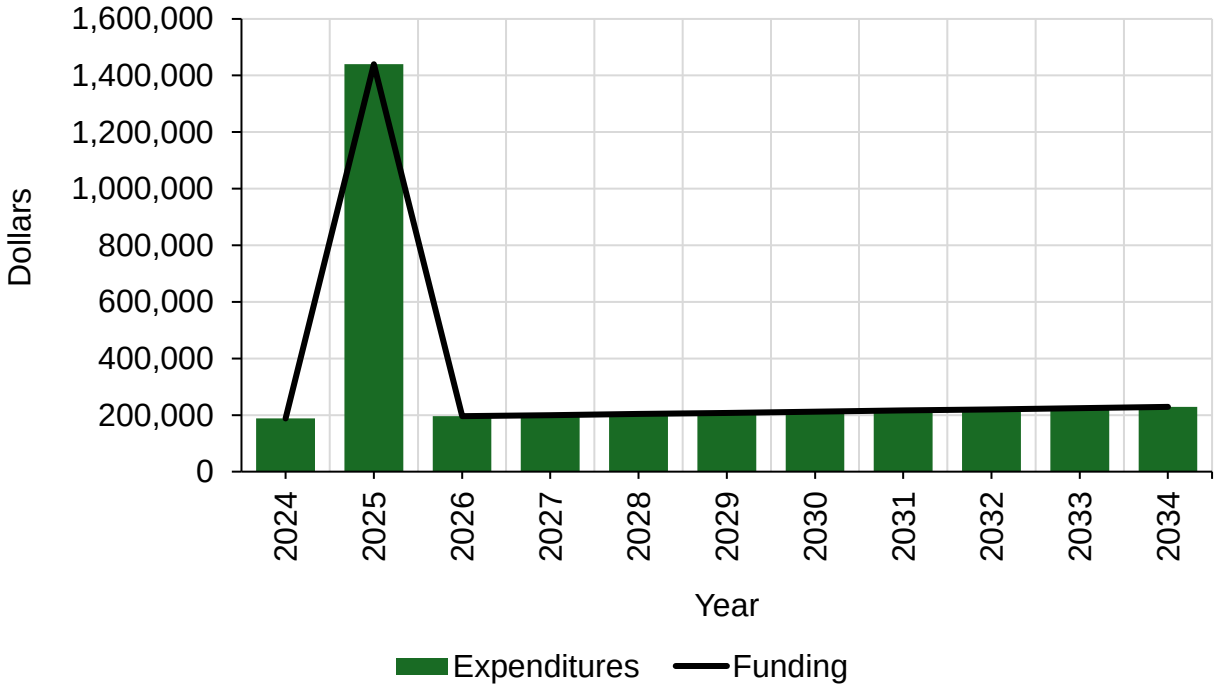


Figure 13-17: Maintenance Overview



On the following two pages, Figure 13-18 and 13-19 list some of the operation and maintenance activities undertaken by municipal staff for the category.

Figure 13-18: Operation Activities

Component	Activity	Interval	Description	Purpose
Curb Stops	Inspection	Annually	Curb stops are inspected for grade and structural deficiencies.	Prolonged life of infrastructure.
Relief Valves	Inspection	Bi-Annually	Valves are inspected and excess water is removed.	Prolonged life of infrastructure.
Monitoring Wells (Network Structures)	Inspection	Annually	Visual inspection of well integrity and positive surface drainage.	Preserve integrity of water source and ensure source water protection.
Wells (Network Structures)	Inspection	Each Visit	Inspection of the area around external wells at each pumphouse.	Optimal water quantity and quality.
Hydrants	Inspection	Annually	Visual inspection of hydrants for structural and operational deficiencies.	Hydrants are in optimal operating condition in an emergency.
Water Tower (Network Structures)	Structure Inspection	Quarterly	Water tower components are inspected for deficiencies.	Prolonged life of infrastructure and maintained service delivery.

Figure 13-19: Maintenance Activities

Component	Activity	Interval	Description	Purpose
Distribution Mains	Dead-End Flushing	Bi-Monthly	Water is released at a high velocity from hydrants.	Prolonged life of infrastructure and improved water quality.
Mainline Valves	Exercising	Annually	Valves are open, closed, and cleaned.	Prolonged life of infrastructure.
Network Structures	Floor Cleaning and Repainting	Annually	Floors are cleaned and repainted.	Maintained cleanliness and aesthetic of facility.
Distribution Mains	Flushing	Bi-Annually	Water is released at a high velocity from hydrants.	Prolonged life of infrastructure and improved water quality.
Hydrants	Flushing	Bi-Annually	Water is released at a high velocity from hydrants.	Improved water quality.
Distribution Mains	Reactive Spot Repairs	Annually	Removal and replacement of distribution main segment.	Prolonged life of infrastructure and improved water quality.

The operation and maintenance lifecycle strategy indicates all expenditures to be fully funded. Included is a non-recurring maintenance expense (secondary expenditure) in the amount of $1,248,100 for 2025. This is to support the construction of an overhang as well as an exterior repainting of the Gordon St water tower.

13.4.4 Replacement

Summarizing replacement activities for water assets relied heavily on utilizing the age of an asset to estimate a replacement date. Whenever possible, other methods such as referencing the 2024 Adopted Budget and consulting with OCWA staff were utilized to confirm the service life for an item. Figure 13-20 outlines forecasted replacements.

Figure 13-20: Projected Upcoming Replacements

Year	Asset ID	Description	Projected Cost
2024	14647	Well #1 Chlorine Contact	$261,500
2031	22235	Well #1 C12 Analyzer	$7,788
2031	22234	Well #1 Turbidimeter	$17,184

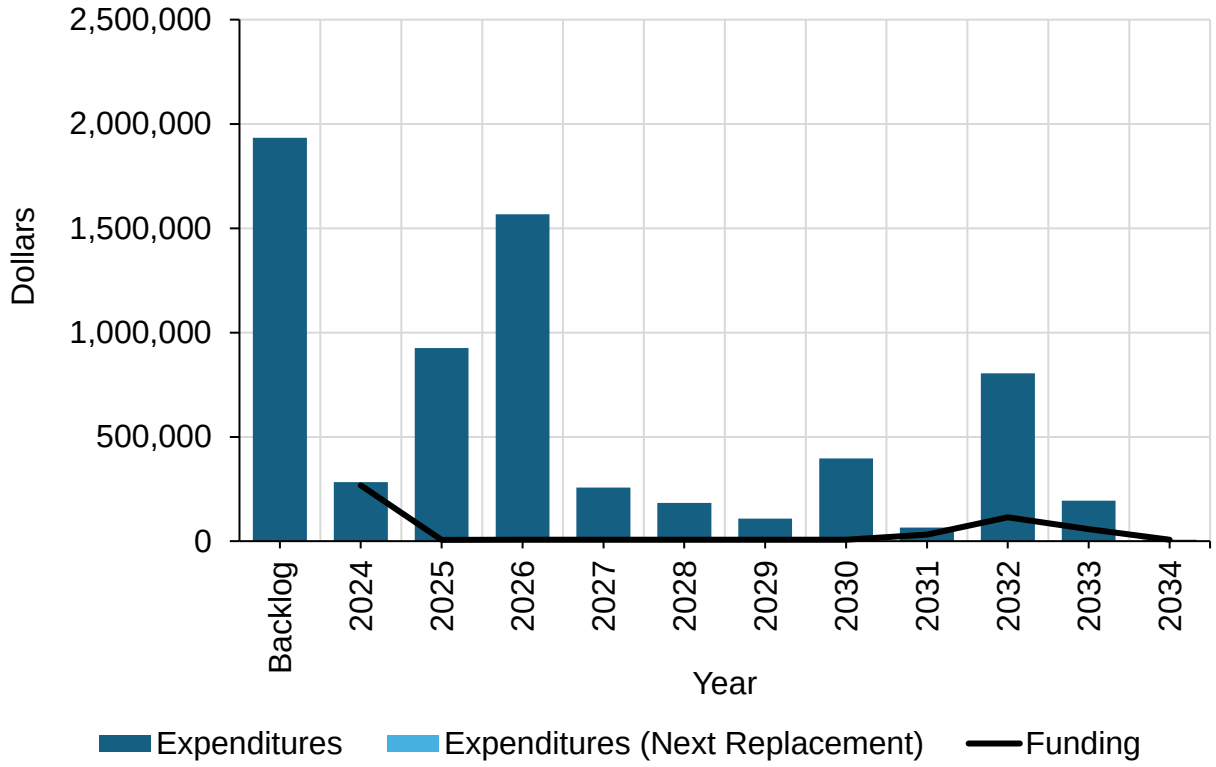
Below, Figure 13-21 highlights projected replacement expenditures.

Figure 13-21: Projected Replacement Expenditures

Planning Period	Year	Projected Expenditures	Projected Funding	Balance
Backlog	Backlog	$1,933,622		-$1,933,622
Year 0	2024	$283,782	$267,500	-$16,282
Year 1	2025	$925,351	$6,120	-$919,231
Year 2	2026	$1,567,199	$6,242	-$1,560,957
Year 3	2027	$256,391	$6,367	-$250,024
Year 4	2028	$182,583	$6,495	-$176,088
Year 5	2029	$107,768	$6,624	-$101,144
Year 6	2030	$395,840	$6,757	-$389,083
Year 7	2031	$64,823	$31,864	-$32,959
Year 8	2032	$805,034	$114,445	-$690,589
Year 9	2033	$194,032	$57,171	-$136,861
Year 10	2034	$7,314	$7,314	$0
Total		**$6,723,739**	**$516,899**	**-$6,206,840**

Figure 13-22 showcases the replacement overview.

Figure 13-22: Replacement Overview



Overall, the replacement lifecycle activity for water assets concludes with a funding shortfall of $6,206,840. This is partly due to the $1,933,622 of backlogged assets, meaning their useful life has expired based on age. Scheduled projects include:

- An estimated $781,001 for water infrastructure associated with the reconstruction of Pine Grove Avenue, projected to occur in 2025. This project is currently unfunded.
- An estimated $639,914 for water infrastructure associated with the reconstruction of Centennial Road, projected to occur in 2026. This project is currently unfunded.
- An estimated $867,595 for water infrastructure associated with the reconstruction of Steeles Street, projected to occur in 2026. This project is currently unfunded.
- An estimated $562,377 for water infrastructure associated with the reconstruction and realignment of Industrial Road, projected to occur in 2032. This project is currently unfunded.

13.4.5 Lifecycle Overview

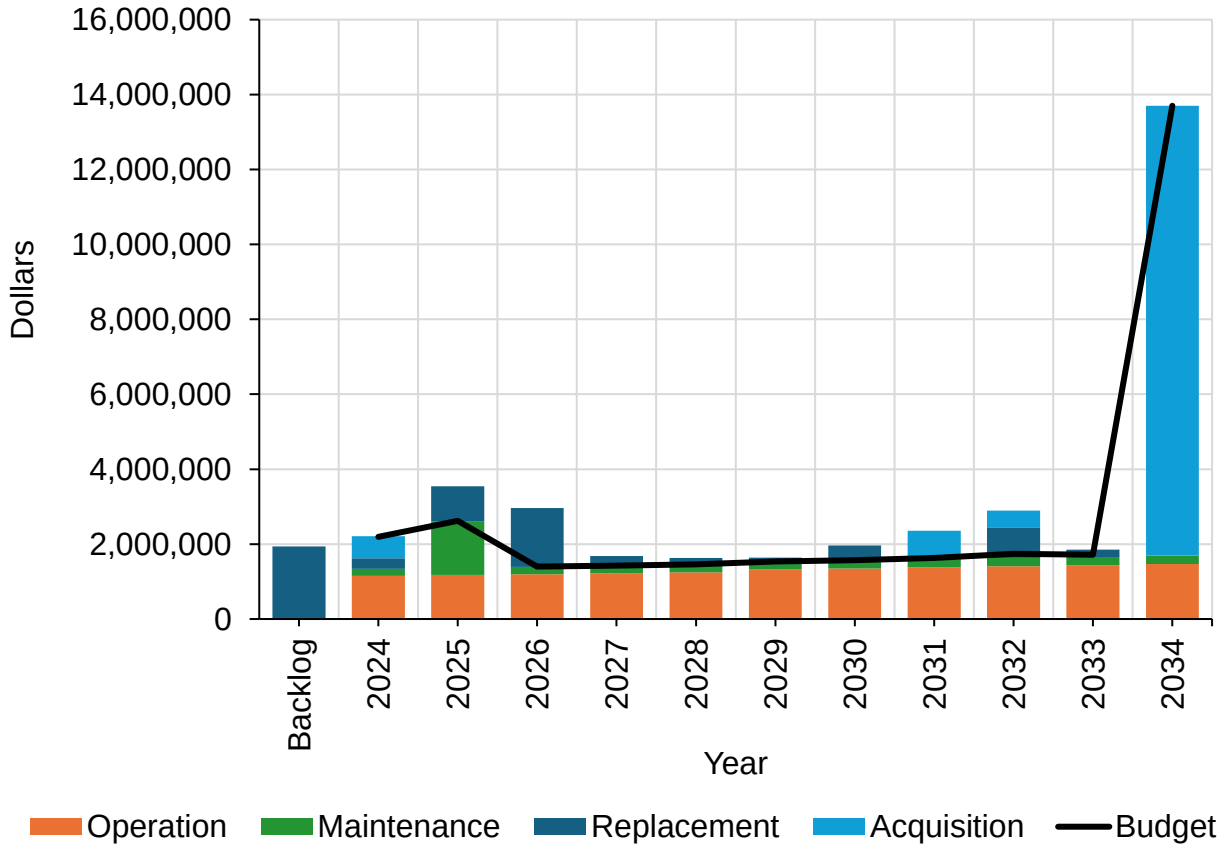
Visualizing all elements of the water lifecycle strategy, Figure 13-23 highlights projected expenditures.

Figure 13-23: Projected Lifecycle Expenditures

Planning Period	Year	Acquisition	Operation	Maintenance	Replacement	Total Expenditures	Total Funding	Balance
Backlog	Backlog	$0			$1,933,622	$1,933,622		-$1,933,622
Year 0	2024	$585,000	$1,153,945	$187,975	$283,782	$2,210,702	$2,194,420	-$16,282
Year 1	2025	$0	$1,174,811	$1,439,835	$925,351	$3,539,996	$2,620,765	-$919,231
Year 2	2026	$0	$1,198,307	$195,569	$1,567,199	$2,961,076	$1,400,119	-$1,560,957
Year 3	2027	$0	$1,222,273	$199,481	$256,391	$1,678,145	$1,428,121	-$250,024
Year 4	2028	$0	$1,246,719	$203,470	$182,583	$1,632,772	$1,456,684	-$176,088
Year 5	2029	$0	$1,325,958	$207,540	$107,768	$1,641,266	$1,540,122	-$101,144
Year 6	2030	$0	$1,352,477	$211,690	$395,840	$1,960,007	$1,570,924	-$389,083
Year 7	2031	$700,000	$1,379,526	$215,924	$64,823	$2,360,274	$1,627,315	-$732,959
Year 8	2032	$463,872	$1,407,117	$220,243	$805,034	$2,896,265	$1,741,804	-$1,154,461
Year 9	2033	$0	$1,435,259	$224,648	$194,032	$1,853,938	$1,717,077	-$136,861
Year 10	2034	$12,000,000	$1,463,964	$229,140	$7,314	$13,700,419	$13,700,419	$0
Total		**$13,748,872**	**$14,360,356**	**$3,535,514**	**$6,723,739**	**$38,368,482**	**$30,997,770**	**-$7,370,712**

Figure 13-24 showcases the lifecycle overview chart.

Figure 13-24: Lifecycle Overview



A total deficit of $7,370,712 is presented for the water category. Of the funding gap, over 80% stems from replacement activities with the remaining due to acquisition costs in 2031 and 2032.

13.5 Risk Management

Water distribution is a critical service for our community. As stated in section 13.3, over 3,200 properties depend on our infrastructure to provide a safe and reliable source of drinking water.

13.5.1 Critical Assets

To begin discussing risk, critical assets must be identified. These are asset which, in the event of failure, would carry the most significant impact to services and consequences to the organization. Below, Figure 13-25 suggests critical water assets.

Figure 13-25: Critical Assets

Segment	Critical Asset
Network Structures	Production Wells
Network Structures	Water Towers

In lieu of assessing the risk to individual components of each network structure, the full network structure has been listed as a critical asset.

13.5.2 Risk Assessment

The lifecycle strategy for water assets indicates an insufficient level of funding over the 10-year period. As discussed in 13.4.5, to manage the gap lifecycle activities must be adjusted or deferred to a later date. Figure 13-26 outlines the potential risk that may be introduced in the even a lifecycle activity is deferred.

Figure 13-26: Lifecycle Activities and Potential Risk

Deferred Activity	Potential Risk
Acquisition	▪ Increased likelihood of capacity issues at production wells ▪ Increased likelihood of development challenges due to capacity issues
Operation and Maintenance	▪ Increased likelihood of frequent deficiencies ▪ Increased likelihood of reduced performance ▪ Increased likelihood of legal non-compliance
Replacement	▪ Increased likelihood of capacity issues at production wells ▪ Increased likelihood of decreased performance due to age ▪ Increased likelihood of higher maintenance costs due to age ▪ Increased likelihood of higher replacement costs due to age

13.5.3 Potential Service Impact

In the event of critical asset failure, a disruption to services is likely to occur. Depending on the extent of infrastructure failure, the disruption could be felt by few or many customers.

Figure 13-27 outlines possible service impacts.

Figure 13-27: Potential Service Impacts

Segment	Critical Asset	Potential Service Impact
Network Structures	Production Wells	▪ Increased risk for water supply capacity issues ▪ Potential water quality concerns, depending on nature of failure
Network Structures	Water Towers	▪ Reduced or loss of water pressure, impacting customers and fire response services ▪ Reduced or loss of water supply regulation, increasing the risk of service outages

13.5.4 Potential Consequences

Alongside disruptions to service are potential consequences for the organization. Due to the regulation surrounding the provision of drinking water, the consequences have the potential to be severe, depending on the type of failure.

Figure 13-28 suggests likely consequences.

Figure 13-28: Potential Consequences

Consequence Type	Likelihood
Environmental	Unlikely
Financial	Likely
Health/Safety	Likely
Legal/Compliance	Likely
Operational	Likely
Reputational	Likely
Service Delivery	Likely

13-5.5 Climate Change

The presence of climate change brings additional risk to service provision. Infrastructure has the potential to be impacted by the factors introduced due to climate change, which may result in the Town adjusting its approach to operating water assets.

Below, Figure 13-29 explores factors of climate change, the potential impact, and possible risk that may result.

Figure 13-29: Climate Change Risks

Factor	Potential Impact	Potential Lifecycle Risk
Frequency of Severe Weather	▪ Increased frequency of high rainfall events resulting in flooding. ▪ Increased frequency of damage to exterior network structure elements.	▪ Higher operating and maintenance costs to manage pooling water near wells. ▪ Higher maintenance costs due to more frequent repairs to exterior network structure elements.
Higher Average Temperatures	▪ Increased rate of deterioration for exterior network structure elements. ▪ Increased customer water consumption for cooling and property maintenance.	▪ Higher maintenance costs to manage increase wear and tear. ▪ Higher acquisition and replacement costs for more resilient materials. ▪ Higher acquisition and replacement costs for expanding water capacity.
Regulatory and Legislative Changes	▪ Increased regulation surrounding source water protection. ▪ Increased cost of utilities.	▪ Higher operating and maintenance costs. ▪ Higher acquisition and replacement costs to purchase compliant equipment.

13.6 Recommendations

Similar to wastewater, the naturally high importance of water distribution services calls for the category to be prioritized for improvements to the asset inventory.

First, continue to focus on linking records in the asset inventory to the Town's GIS infrastructure to improve the information available for each asset. Additionally, this will allow for straightforward cross referencing of information in the GIS to information in the inventory.

Second, determine a strategy to link visual condition assessment data of water assets to records in the inventory. This can be accomplished by establishing a clear relationship between the assessed condition and the condition rating scale available in the Town's enterprise asset management software. Having condition information readily available will allow for improved modeling of the category and support the development of planning documents such as annual budgets and asset management plans.

Third, explore options to further integrate OCWA staff and the Town's engineering team into asset management program initiatives for water assets. This includes but is not limited to developing a strategy to share GIS information for the mutual improvement of geospatial information and improving the assessment of lifecycle needs.

Section 14 – Future Demand

O. Reg. 588/17 requires municipalities with a population of less than 25,000 to discuss assumptions regarding forecasted change in population or economic activity, and how those assumptions relate to the lifecycle strategy for assets.

Recognizing the projected or planned increase in demand is paramount to a successful long-term asset lifecycle strategy.

14.1 Projected Growth

Released by Statistics Canada in February 2022, table 98-10-0002-01 regarding population and dwelling counts placed Shelburne at a 2021 population of 8,994 with 3,150 total private dwellings. Compared to a population of 8,126 and total private dwellings of 2,825 as reported in the 2016 census, the percent change vs 2021 is listed as a growth of 10.7% for population and 11.5% for private dwellings.

Furthermore, as detailed in the Town of Shelburne Briefing Note to the Ministry of Infrastructure Delegation dated August 22, 2023, the Town is forecasted to add over 2,000 new homes for an estimated 5,500 additional residents by the year 2051. This will increase the Town's approximate 2023 population of 9,400 to over 15,000 as outlined in the County of Dufferin's Municipal Comprehensive Review in response to growth targets in accordance with the Growth Plan for the Greater Golden Horseshoe.

14.2 Relationship to Asset Lifecycle Strategy

Population growth is directly connected to the demand placed on municipal infrastructure.

For services where capacity is key performance measure, such as water, wastewater, and transportation, a rise in demand has an impact on all phases of lifecycle management. For a higher level of capacity to be attainable, the service must be expanded. This results in new acquisitions needing to be forecasted sooner and at a higher cost for better performing infrastructure. Second, existing assets are likely to require more frequent maintenance to compensate for higher rates of wear and tear, and aging assets will likely need to be replaced sooner to maintain the expected level of service.

For assets where capacity is less of a driver of performance, such as facilities, the impact on asset lifecycle may not be immediately recognized. Over the long term, it is likely to become apparent that interior facility components are degrading at an increased rate due to higher use, resulting in higher operation and maintenance costs.

Additionally, acquisition and replacement costs will increase significantly in the event it is determined that a facility requires renovation or expansion to accommodate the increased volume of customers.

Recognizing the impact that an increase in demand has on asset lifecycle is vital to a sustainable asset management strategy. At minimum, it is key for the Town to maintain regular investment in capital assets to prevent an extensive backlog of replacement costs for aging infrastructure. Additionally, the continuation of strategic long-term financial planning structured alongside the forecasted shifts in demand will ensure that when demand changes and an increase in the level of funding is required, that it is attainable.

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